Customer Success Stories

Proven Solutions for Every Industry

VISUALIZE | HISTORIZE | MOBILIZE | ANALYZE | CLOUD IoT

ICONICS

Make the Invisible Visible™

Government Infrastructure

Power & Energy Management, Utilities

Energy Smart Buildings

Manufacturing & Machine Builders

Oil, Gas & Petrochemical

Food & Pharmaceutical

Water & Wastewater

ICONICS Thanks Our Loyal Customers from Around the World

ICONICS is a leading provider of award-winning real-time visualization, HMI/SCADA, energy management, fault detection, manufacturing intelligence, IoT, and a suite of analytics solutions for operational excellence. ICONICS software delivers significant cost reductions in design, building, deployment, and maintenance for a wide variety of manufacturing companies, building owners, facility managers, and government organizations. ICONICS solutions have helped our customers to be more profitable, agile and efficient, to improve quality, and to be more sustainable. Our products are installed in over 350,000 applications worldwide, continuously delivering value to more than 70% of the Global 500.

Microsoft Partner

2017 Partner of the Year Winner
Application Development Award

ICONICS

Make the Invisible Visible™

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About ICONICS

Founded in 1986, ICONICS is an award-winning independent software provider offering real-time visualization, HMI/SCADA, energy management, fault detection, manufacturing intelligence, MES, and a suite of analytics solutions for operational excellence. ICONICS solutions are installed in 70 percent of the Global 500 companies around the world, helping customers to be more profitable, agile and efficient, to improve quality, and to be more sustainable.

Make the Invisible Visible™

ICONICS is leading the way in cloud-based solutions with its HMI/SCADA, analytics, mobile and data historian to help its customers embrace the Internet of Things (IoT). ICONICS is committed to Industry 4.0 standards and its products are used in manufacturing, building automation, oil and gas, renewable energy, utilities, water and wastewater, pharmaceuticals, automotive, and many other industries. ICONICS' advanced visualization, productivity, and sustainability solutions are built on its flagship products: GENESIS64™ HMI/SCADA, IoTWorX™ embedded solution for the cloud, Hyper Historian™ plant historian, AnalytiX® solution suite, and MobileHMI™ mobile apps. Delivering information anytime, anywhere, ICONICS' solutions scale from the smallest standalone embedded projects to the largest enterprise applications.

ICONICS world headquarters is located in Foxborough, Massachusetts, USA, and the company has offices located throughout the U.S., Europe, Asia, and Australia. ICONICS promotes an international culture of innovation, creativity, and excellence in product design, development, technical support, training, sales, and consulting services for end users, systems integrators, OEMs, and partners. ICONICS has over 350,000 applications installed in multiple industries worldwide.

For over 30 years, ICONICS has been a leader in the area of standards-based connectivity, providing direct, real-time OPC, BACnet, SNMP, SAP, Web services and database interfaces through secure communication protocols from the shop floor to the enterprise. ICONICS products are OPC Foundation certified for OPC and OPC UA. ICONICS has also received the BACnet Advanced Workstation (B-AWS) certification for its excellence in energy smart buildings from the BTL Organization.

ICONICS is a charter member of the OPC Foundation (www.opcfoundation.org), an organization dedicated to "ensuring interoperability in automation" by creating and maintaining open specifications that standardize communication. ICONICS has been on the OPC Foundation Board of directors since 2003 and provides "OPC to the Core" 64- and 32-bit solutions for the development of OPC Servers, OPC clients and OPC-enabled controls.

OPC CHARTER MEMBER

ICONICS is a four-time Microsoft Partner of the Year award winner and longtime Microsoft Gold Certified Partner. In 2017, ICONICS was presented with the prestigious Microsoft Application Development Partner of the Year award, having previously been named a CityNext and Sustainability Partner of the Year, continuing its decades-long relationship as a managed Microsoft ISV partner.

President's Message

I am excited to present the 2017-2018 Edition of our Customer Success Story Catalog. It chronicles a vast array of applications critical to real-time operations around the world that utilize ICONICS software solutions. With over three decades of experience, ICONICS is an extremely agile company, adapting to market trends, listening to its customers, and delivering innovative cutting-edge technology solutions and results.

What started in 1986 as an idea to deliver icon-driven HMI and SCADA products based on Microsoft DOS has evolved into an extensive family of solutions. Today, ICONICS is at the forefront of product innovation in areas such as the Internet of Things (IoT), advanced analytics solutions, cloud computing, and the next generation of 2D and 3D visualization for wearable devices such as the new Holographic Machine Interface (HMI) based on Microsoft HoloLens technology.

ICONICS aims to "Make the Invisible Visible™", accessing untapped data for visualization, control, analytics, rapid historical storage/retrieval, wireless mobility, and cloud solutions.

Russell L. Agrusa
President & CEO
ICONICS, Inc.

Inside the Success Story Catalog
This newly released catalog provides many real customer examples of how our products have been applied in a wide variety of applications around the world and has been organized into the following industry categories:

- Energy Smart Buildings
- Government Infrastructure
- Oil, Gas & Petrochemical
- Renewable Energy
- Food & Pharmaceutical
- Machine Builders & Manufacturing
- Power & Utilities
- Water & Wastewater

As a reflection of the many customer successes achieved over our history, ICONICS has won the 2017 Microsoft Application Development Partner of the Year award; our fourth in total. I would like to thank all of the customers and partners whose efforts are reflected in this catalog. If you are not yet a customer or partner, I invite you to take some time to get to know ICONICS through these stories, with the hope that we can "Make the Invisible Visible" for your organization.

Sincerely,

Russell L. Agrusa
President and CEO
ICONICS, Inc.

IoT Alliance Partner Program

ICONICS' IoT Alliance Partner program is geared toward manufacturers of computers and IoT devices. It provides end users with the ability to select from a number of hardware platforms from preferred partners that customers can rely on for high-performance operations. ICONICS is working in close collaboration with Intel as a General Member of the Intel® Internet of Things Solutions Alliance to help developers test and recommend IoT edge devices. Through this working partnership, ICONICS and Alliance members provide cutting-edge IoTWorX software technology for the energy, smart buildings and industrial automation markets, delivering ready-to-go communications infrastructure and reducing costs.

ICONICS works closely with its IoT Alliance partners to create fully-tested IoT gateway solutions that are ready for customers to deploy for any energy, smart building or industrial automation application, pre-loaded with standard industry drivers. ICONICS' IoT Alliance Program offers the following benefits:

- Market pull-though will boost Alliance Partners' IoT gateway sales
- Alliance Partners can sell industry-specific solutions
- Ready-to-use IoT gateway with preinstalled industrial protocols
- Pre-tested and approved by ICONICS in cooperation with Alliance Partner
- Featured in ICONICS online directory
- Co-marketing opportunities at ICONICS-sponsored IoT seminars and events
- Optional plugin for your native communications protocol on the IoT gateway

Learn more at **www.iconics.com/IoT-Alliance**.

IoT Alliance Partners

ADLINK TECHNOLOGY INC.
intel IoT Solutions Alliance Premier
kontron
ADVANTECH
Lanner
PHOENIX CONTACT
ARROW
DELL IoT Solutions Partner Program
NEXCOM

ICONICS | IoT Alliance Program

ICONICS | IoT Alliance Program
Preferred Device

ICONICS | IoT Alliance Program
Preferred Provider

Application Development Partner of the Year

In June, ICONICS announced that it won the 2017 Microsoft Application Development Partner of the Year award. The company was honored among a global field of top Microsoft partners for demonstrating excellence in innovation and implementation of customer solutions based on Microsoft technology.

Winner
Microsoft Partner
2017 Partner of the Year
Application Development Award

"ICONICS is honored to have won its fourth Microsoft Partner of the Year award," said Russ Agrusa, President and CEO of ICONICS. "This year's award for Application Development has a special meaning to us because it represents our commitment to helping customers in energy management, manufacturing, buildings and industrial automation to 'make the invisible visible' and to uncover the true value of their data."

Awards were presented in several categories, with winners chosen from a set of more than 2,800 entrants from 115 countries worldwide. ICONICS was recognized for providing outstanding solutions and services in Application Development.

"Our ecosystem of innovative partners is the cornerstone to delivering transformative solutions to our mutual partners. We are pleased to recognize ICONICS for being selected as winner of the 2017 Microsoft Application Development Partner of the Year award."

Ron Huddleston
Corporate Vice President
One Commercial Partner, Microsoft Corp.

The Microsoft Partner of the Year Awards recognize Microsoft partners that have developed and delivered exceptional Microsoft-based solutions during the past year.

With over 350,000 installations in over 80 countries worldwide, ICONICS software is recommended for automating, monitoring and optimizing a customer's most critical assets and has been selected by over 70 percent of Global 500 companies. ICONICS has previously been awarded as a Microsoft CityNext and Sustainability Partner of the Year, continuing its decades-long working relationship as a managed Microsoft ISV partner.

Russ Agrusa (right), President and CEO of ICONICS, receives the 2017 Microsoft Application Development Partner of the Year award from Ron Huddleston (left), Corporate Vice President, One Commercial Partner, Microsoft Corporation.

Symphony of Software Saves Millions

Microsoft and ICONICS Partner to Fine-tune Energy and Maintenance Systems

A small, covert team of engineers at Microsoft cast aside suggestions that the company spend US$60 million to turn its 500-acre headquarters into a smart campus to achieve energy savings and other efficiency gains. Instead, applying an "Internet of Things meets Big Data" approach, the team invented a data-driven software solution based upon ICONICS COTS software solution that is slashing the cost of operating the campus' 125 buildings saving Microsoft millions of dollars.

The application has been so successful that the company and its partners are now helping building managers across the world deploy the same solution. And with commercial buildings consuming an estimated 40 percent of the world's total energy, the potential is huge.

Darrell Smith and his team have been working for more than three years to unify an incongruent network of sensors from different eras (think several decades of different sensor technology and dozens of manufacturers). The software that he and his team built strings together thousands of building sensors that track things like heaters, air conditioners, fans, and lights – harvesting billions of data points per week. That data has given the team deep insights, enabled better diagnostics, and has allowed for far more intelligent decision making. A test run of the program in 13 Microsoft buildings has provided staggering results – not only has Microsoft saved energy and millions in maintenance and utility costs, but the company now is hyper-aware of the way its buildings perform.

Today the campus spans 500 acres. There's a soccer field and cricket pitch, miles of wooded walking paths – and 14.9 million square feet of office space and labs that now function as one interconnected system.

Until recently, Microsoft was using disparate building management systems to manage 30,000 unconnected, sensor-enabled pieces of equipment. Imagine a symphony orchestra, but with every musician playing from different sheet music. Then, imagine trying to conduct that symphony – to make sure the music was on tempo, in key, and starting and stopping as it should. Microsoft's buildings were experiencing data dissonance that would make the works of Igor Stravinsky sound like a barbershop quartet.

This is the challenge faced by many in the Public sector, old legacy equipment that is not perceived to be capable of true energy efficiency!

The question was raised do we rip and replace or try to reduce energy through technology?

"Give me a little data and I'll tell you a little.
Give me a lot of data and I'll save the world."

- Darrell Smith, Director of Facilities and Energy Microsoft

Smith's team created a pilot program in 13 of the buildings on Microsoft's Redmond campus. The team developed an "analytical blanket" based upon ICONICS software to lie on top of the diverse systems used to manage the buildings. The blanket of software enabled equipment and buildings to talk to each other, and to provide a wealth of data to building managers.

The new tool got data out of the buildings – great tidal waves of data that came cascading into the ROC, telling engineers about everything from wasteful lighting schedules to hugely inefficient (but up until then, silent and undetectable) battles being waged between air conditioners and heaters to maintain temperatures.

Engineers are no longer climbing over rooftops, inspecting pump rooms and peering above ceiling tiles, no, engineers are now spending 95% of their time doing engineering. Suddenly, the symphony of sensors was not only following the conductor, its musicians were all playing the same song. As buildings came online and data poured in, it created what engineers called a "target-rich environment" for problem solving.

They used to move from building to building, camping out in each for two weeks at a time to inspect and tune it top to bottom before moving on to the next. It would take them five years to tune up all of the buildings on campus, and then they'd start the process all over again. Their tune-ups were making the buildings run more efficiently, saving the company around $250,000 annually – but the new data gold rush has helped them save six times that much!

ICONICS and its partners are looking to engage with any company, institution or person who is looking to drive energy reductions through technology. We have a suite of tools that can both scale to size and budget. ICONICS promotes an international culture of innovation and are the reigning Microsoft Sustainability Partner of the Year; this award recognizes software innovations built on the Microsoft platform that help organizations, governments and cities around the world reduce their impact on the environment.

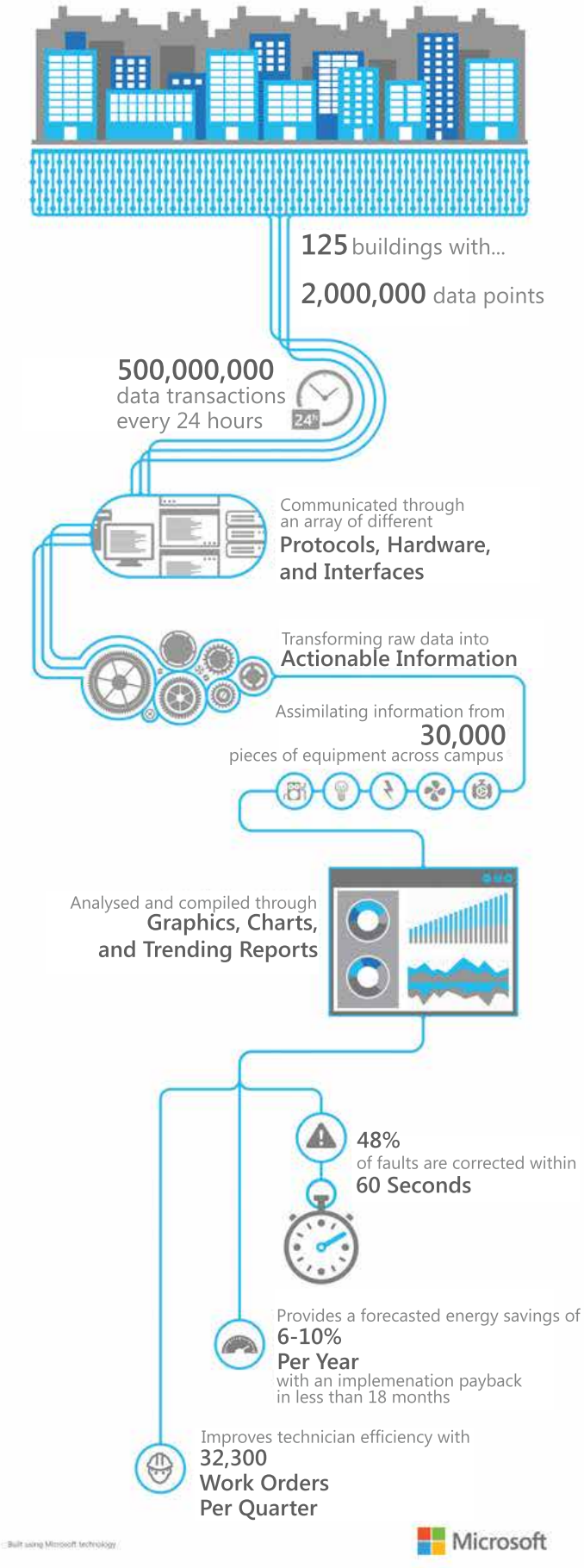
For more information please visit us at: www.iconics.com

This article and its images were excerpted and adapted from Jennifer Warnick's feature story "88 Acres: How Microsoft Quietly Built the City of the Future," which was originally published at www.microsoft.com/stories.

Key features

- Reduces energy consumption and costs
- Extends the life of building assets
- Drives labor efficiencies
- Shrinks carbon footprints

Microsoft's Smart Campus



Empowering cities and citizens

University transforms energy management with big data solution

"We don't want to be just your traditional maintenance organization. We want to be cutting edge and innovative, and in collaboration with Microsoft partner ICONICS, we are able to continue achieving our goals as an energy efficiency leader."

—Jim Jackson, Assistant Vice Chancellor, University of Nebraska-Lincoln

A strong proponent of environmental sustainability, the University of Nebraska-Lincoln (UNL) set an ambitious goal of reducing energy use by 15 percent across many of its buildings. In collaboration with Microsoft CityNext partner ICONICS, the university monitors building performance in real time with a solution that combines big data with the Internet of Things. With the insight to troubleshoot problems immediately, UNL is boosting energy efficiency, saving money, and proactively maintaining mechanical equipment at optimal levels.

University of Nebraska-Lincoln

www.unl.edu
6,487 employees
United States
Education

The University of Nebraska-Lincoln (UNL) is a public research university based in Lincoln, Nebraska. The state's oldest university, UNL currently serves more than 25,000 students.

Partner

ICONICS
www.iconics.com

ICONICS
Make the Invisible Visible™

Microsoft

The man behind the curtain

Jim Jackson is the man behind the curtain, like the Wizard of Oz in the American film classic. He and his team may not always be visible to students, faculty, and staff at the University of Nebraska-Lincoln (UNL). But it's because of the behind-the-scenes work of his Building Systems Maintenance (BSM) team that classroom temperatures are comfortable. And alarm systems function. And the lights turn on when you walk into a building. "We love what we do, and our passion is great customer service," says Jackson, Assistant Vice Chancellor at the University of Nebraska-Lincoln. "And while folks may not know why their buildings are comfortable, it's because of the staff behind the curtain."

Like their predecessors, Jackson and university leadership believe in fiscal responsibility and minimizing the university's environmental footprint. And at a time of growing environmental and fiscal concerns, they want to continue to accelerate the culture of stewardship—both for current students and future generations. "Sustainability is a huge buzzword, but the reality is that we need to continuously improve our resource management," says Jackson. "And for a university like ours with 16.5 million gross square feet of building space, energy savings is a natural focus."

"We try to resolve issues as soon as equipment moves off its optimal performance—preventing it from reaching a crisis point. Our goal is to minimize or avoid equipment degradation and related energy waste."

—Chris Walsh, Director of Buildings Systems Maintenance, University of Nebraska-Lincoln

A few years ago, UNL facilities adopted an ambitious goal of reducing energy consumption in many of its buildings by more than 15 percent. To do so, Jackson and the BSM team turned to advanced technology. "We were good at a lot of things, but at some point you recognize that you can only do so much with existing resources and systems," says Jackson. "We realized that the only way to move forward was through innovation and technology."

Stopping building deterioration

To reduce energy consumption, the BSM team had been installing energy-efficient equipment and automating building systems to ensure that mechanical and electrical equipment—including heating, ventilation, and air conditioning (HVAC) systems—minimized energy waste. The team installed more than 60,000 sensors and control devices on equipment throughout the university, collecting about 7.4 million records every day to help maintenance workers reduce energy use and perform predictive maintenance.

With these systems in place, UNL was well on its way to minimizing building energy use. Yet just like a brand-new car that's driven off the lot, building equipment starts to deteriorate as soon as it's installed, losing energy efficiency over time. To mitigate deterioration, UNL had in the past performed ad-hoc recommissioning, but was now developing a comprehensive recommissioning program.

In 2014, Jackson attended a Big Ten Universities directors meeting and learned about "constant commissioning," which involved keeping mechanical systems operating at optimum levels even as they age—and capturing the same energy savings over time. "If you look at a building, you'll see a big decline in its performance roughly every five years," says Jackson. "We wanted to find a way to maintain optimal performance without the expense of periodic recommissioning."

"With the ICONICS FDD technology in place, we are often able to catch anomalies, show up, and say, 'Hey, your room's not quite working right.' Students, faculty, and staff appreciate when we respond before they become aware of a problem."

—Lalit Agarwal, Director of Facilities Systems, University of Nebraska-Lincoln

Fixing equipment before it reaches a crisis point

Jackson and the BSM team decided to implement a fault detection and diagnostics (FDD) solution developed by Microsoft CityNext partner ICONICS. Built on Microsoft technologies such as SQL Server database for configuration and runtime operations, the solution combines big data with the Internet of Things (IoT) to help UNL identify and fix problems well before mechanical equipment breaks down.

From air handlers to pumps to fan motors, UNL has attached sensors to equipment in buildings across its campus to monitor performance in real time. When a sensor captures a reading outside of designated parameters set by the BSM team, an alert is triggered and sent to the university's maintenance control center, where the issue is either fixed remotely or a technician is dispatched to the building.

"In the past, an alarm would be triggered only when the equipment was running out of control or had already broken," says Jackson. "Now, we are catching problems much earlier on the degradation curve, so when something starts to drift we can immediately respond." For example, one time a variable air volume damper cooling a room was stuck on open, causing a reheat valve to overcompensate by generating excessive heat. Since the room maintained a comfortable temperature, the problem wouldn't have been detected without the FDD solution in place and would have created unnecessary costs.

UNL began installing the ICONICS FDD solution in early 2016 and currently uses it to monitor 52 buildings. In the next few years, the university plans to track as many as 80 major university buildings with FDD, along with five campus utility plants. "As we construct new buildings, we implement FDD to prevent the degradation of building equipment," says Chris Walsh, Director of Building Systems Maintenance at the University of Nebraska-Lincoln.

Maintaining energy efficiency gains as the years pass

Thanks to FDD, UNL is avoiding catastrophic breakdowns, while maintaining energy efficiency gains. Rather than recommissioning campus buildings every five years and watching energy efficiency diminish over time, the BSM team now continuously commissions mechanical systems—making small adjustments to preserve building equipment performance. "We try to resolve issues as soon as equipment moves off its optimal performance—preventing it from reaching a crisis point," says Walsh. "Our goal is to minimize or avoid equipment degradation and related energy waste."

By resolving issues as soon as they occur, the university is also cutting energy costs. For example, it is possible for a single air handler that's running close to the point of failure to run so inefficiently that it can generate as much as US$30,000 in energy costs per year. Because an FDD alert can trigger when an air handler slips below optimal performance, it's possible to avoid energy costs of as much as $25,000 per air handler each year—a savings of 84 percent.

Improving service to students and faculty

The BSM team has also transformed how it operates. When an alert is triggered, engineers often fix the issue remotely, at little to no cost. If technicians need to physically travel to the building, they have detailed information about the problem before they arrive, allowing them to repair issues faster.

Microsoft

What's more, the team can now easily prioritize maintenance projects according to their importance, ensuring that limited staff is deployed to the highest-priority problems.

By addressing issues before they become critical, BSM helps maintain a more comfortable learning atmosphere for UNL students and faculty, which also improves relations. "In the past, if a room's temperature got warm, the instructor or students would have to report the problem and wait for the maintenance technician to arrive," says Lalit Agarwal, Director of Facilities Systems at the University of Nebraska-Lincoln. "With the ICONICS FDD technology in place, we are often able to catch anomalies, show up, and say, 'Hey, your room's not quite working right.' Students, faculty, and staff appreciate when we respond before they become aware of a problem."

An energy efficiency leader

With its FDD solution in place, the university is well on its way to meeting its energy efficiency goals. In the first year of implementation, for example, the solution detected about 1,100 faults on average each month. Left uncorrected for a year, these would have added up to almost $200,000 in wasted energy. "Using technology to monitor our buildings, we are improving the way we use our resources during a time of both environmental and budget concerns," says Jackson.

Jackson says the results have captured the attention of the university leaders, while generating positive momentum for UNL as a whole. "Our efforts are a great recruiting tool—especially for the growing number of energy-conscious students."

He may be the man behind the curtain, but Jackson and his team are leading the way as colleges and universities across the United States transform their energy futures. "We don't want to be just your traditional maintenance organization," says Jackson. "We want to be innovative and cutting edge, and in collaboration with Microsoft partner ICONICS, we are able to continue achieving our goals as an energy efficiency leader."

Software and services

Microsoft SQL Server

Microsoft CityNext

Empowering more sustainable, prosperous, and economically competitive cities—with a simplified approach that puts people first!

For more information please visit:
enterprise.microsoft.com/en-us/industries/citynext

Customer Success Stories

For more information on other Microsoft CityNext customer success stories, please visit:
enterprise.microsoft.com/en-us/industries/citynext/customerstories

Microsoft

Software Solutions

ICONICS automation suite of software solutions helps customers "Make the Invisible Visible™" by connecting untapped valuable data for use in visualization, control, analysis, rapid historical storage/retrieval and mobility, on-premises, in the cloud, or hybrid multi-level applications. For more information, visit ICONICS online at **www.iconics.com**.

HMI/SCADA

ICONICS creates 64-bit and 32-bit HMI/SCADA software suites that help customers visualize and control real-time operations in a wide variety of industries and applications worldwide.

GENESIS64™

GENESIS64™ suite is a native .NET application that delivers unparalleled HMI/SCADA performance with OPC and BACnet open-standard connectivity. The GENESIS64 suite includes solutions that allow for connectivity from plant floor and building facilities to corporate business systems. Designed to leverage 64-bit, OPC UA, and .NET managed code, GENESIS64 allows operators, executives, and IT professionals to integrate real-time manufacturing, energy, and business information into a secure and unified web-enabled visualization dashboard.

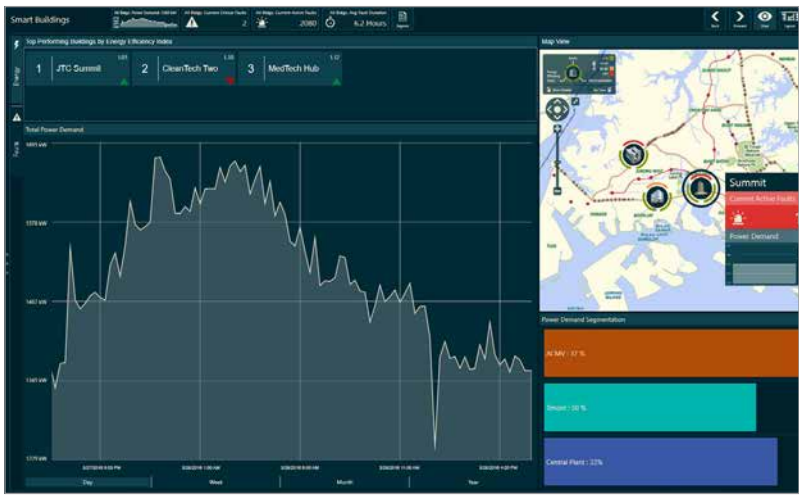
AlarmWorX™64 mmx

AlarmWorX™64 Multimedia (MMX) is a complete and comprehensive OPC-based alarm management application. AlarmWorX64 MMX is a distributed, enterprise-wide alarm notification system that delivers real-time alarm information to the user. Leverage email, pager, fax, voice, text-to-speech, and phone to alert users subscribed to an application.

HISTORIANS

ICONICS' Historian family of products provides flexible data historian solutions, whether for high speed or cloud-based applications that demand efficient data storage to archive years of information, ensuring that critical data is never more than a few clicks away.

Hyper Historian™

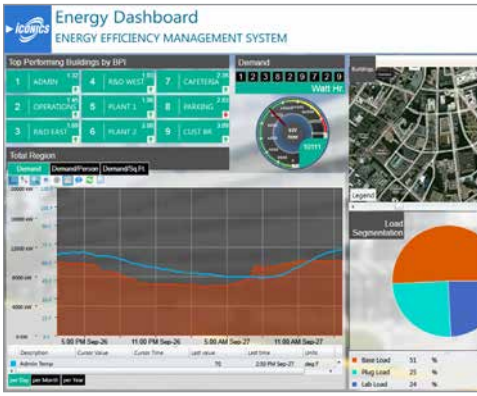


Hyper Historian™ is an advanced 64-bit high-speed, reliable, and robust plant historian. Designed for the most mission-critical applications, Hyper Historian delivers unparalleled performance with very efficient use of resources. Hyper Historian leverages the latest Microsoft platforms and includes integration with SQL Server. This technology makes Hyper Historian the most efficient, real-time plant historian for any Microsoft 64-bit operating system. Combining a high compression, advanced algorithm, and designed to leverage 64-bit hardware and software architectures, Hyper Historian can access more CPU power and memory than traditional 32-bit based historians, providing the highest performance possible on all standard PC-based platforms.

ANALYTICS

ICONICS has created an analytics suite of products that transforms large amounts of real-time data from manufacturing and facility operations into actionable intelligence, driving improvement in productivity, efficiency, quality and sustainability.

Energy AnalytiX®

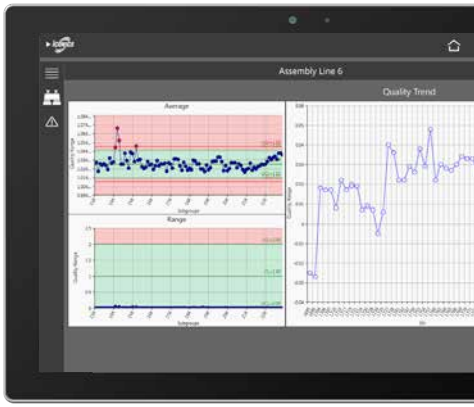


Energy AnalytiX® is an energy monitoring, analysis, and management system that delivers rich platform and browser-independent, real-time visualization providing open universal data connectivity and data integration to a wide variety of BMS, SCADA, ERP, and control systems. Managers of any building or plant have a revolutionary smart energy software solution that is intuitive to configure, customize, and operate. Energy AnalytiX includes built-in calculations, analytics, data historian, reporting, and the rich visualization needed to take decisive action to reduce and manage utility costs and consumption.

Facility AnalytiX®

Facility AnalytiX® is a complete, continuous commissioning software solution based on ICONICS' advanced Fault Detection and Diagnostics (FDD) technology that significantly reduces costs and improves operational efficiency. Facility AnalytiX incorporates user customizable fault rules to report faults and failures and weighs the probability of equipment failure and advise personnel of immediate preventative actions that can be taken, improving safety, and optimizing energy savings. An extensive library of standard HVAC and process equipment diagnostic models minimizes configuration, while a rules-based editor enables intuitive customization and new equipment diagnostic modeling.

Quality AnalytiX®



Quality AnalytiX® enables operators, quality personnel, manufacturing engineers, and management to view quality SPC data and other production parameters impacting product quality. Apply any of the extensive set of built-in SPC calculations to any process variable and integrate SPC data into expressions and logic to drive corrective actions based on process trends. Quality AnalytiX leverages ICONICS Hyper Historian™ technology for data collection and calculations. The architecture supports large enterprise-wide SPC quality programs as well as applications requiring rapid sample rates.

BridgeWorX™64

BridgeWorX™64 provides the latest 64-bit data bridging technology for ICONICS products. Graphical data bridging enables users to rapidly implement data orchestration and integration tasks that adhere to business logic without requiring any programming. BridgeWorX64 can access Microsoft SQL Server, Oracle, SAP, OPC, BACnet, and virtually any real-time or archived manufacturing or business data source.

ReportWorX™64

ReportWorX™64 is a powerful reporting tool that turns volumes of data into manufacturing intelligence. ReportWorX64 empowers users to create reports using data integrated from any source within any system. Connect to data from the plant floor, corporate databases, and everywhere in between via OPC, OPC UA, BACnet, Modbus, and SNMP. ReportWorX64 can also retrieve data from Hyper Historian, AlarmWorX64, TrendWorX64, and other ICONICS data sources. Based on scalable Microsoft .NET technology, ReportWorX64 pushes data into report spreadsheets using the power of Microsoft Excel. Its advanced scheduling engine delivers reports automatically via the web, from an HMI screen, or based on user-specified criteria.

Software Solutions

WEB AND MOBILE SOLUTIONS

With ICONICS' Web and Mobile Solutions, the graphics, dashboards, trends and reports that users create to manage operations can be viewed and analyzed from Web-connected devices, providing secure management access from your plant, factory, building, campus or via phone/tablet on the go.

WebHMI™

WebHMI™ uses Web browsers to provide an interface with ICONICS' graphics, trending and alarming applications (applications within the HMI/SCADA suites) with no need to install any software onto the remote clients or to export or convert displays.

MobileHMI™

MobileHMI™ is an enterprise mobile application that runs on hundreds of different phones, tablets, and web browsers and can scale to thousands of devices. MobileHMI delivers real-time rich visualization, historical trends, and alarm notifications without compromising security. MobileHMI addresses the growing need for connectivity away from operator stations, allowing personnel to monitor and control from anywhere. The consistent user experience across any device enables teams to mobilize without requiring any upfront investment in device standardization.

KPIWorX™

KPIWorX™ delivers a powerful visualization and analysis tool directly to executives, managers, and industry personnel. Connect all devices to KPIWorX to effortlessly manage and navigate assets with real-time data. Configure self-service dashboards that meet specific industry needs while interacting with displays in runtime. Visualize the most important performance indicators of any system or business from any desktop or mobile client and transfer dashboards seamlessly. KPIWorX's advanced user experience features automatically adjust using KPIWorX responsive UI while also providing a vast library of preconfigured industry and interface symbols.

IoTWorX™

IoTWorX™ combines ICONICS' new IoT gateway technology with its proven HMI/SCADA, analytics, and mobile solutions running in the cloud. ICONICS offers manufacturers and facility managers several key IoT technologies, including rich connectivity to things, secure cloud communications, and built-in real-time visualization and analytics. Connect to virtually any automation equipment through supported industry protocols such as BACnet, SNMP, Modbus, OPC UA, and classic OPC Tunneling. ICONICS' IoT solution takes maximum advantage of the Azure cloud to provide global visibility, scalability, and reliability. Leverage standard ICONICS apps in the cloud such as GENESIS64, Hyper Historian, AnalytiX®, and more. Optionally integrate Microsoft Azure services such as Power BI and Machine Learning to provide greater depth of analysis.

32-BIT DATA INTELLIGENCE SOLUTIONS

ICONICS' 32-bit suite of solutions provides users with accurate up-to-date, real-time information from all enterprise systems, resulting in increased profitability and streamlined business efficiency.

GENESIS32

GENESIS32™ provides advanced visualization solutions for 32-bit platforms, connecting plant-level operations to the enterprise and turning real-time data into a competitive advantage.

BizViz

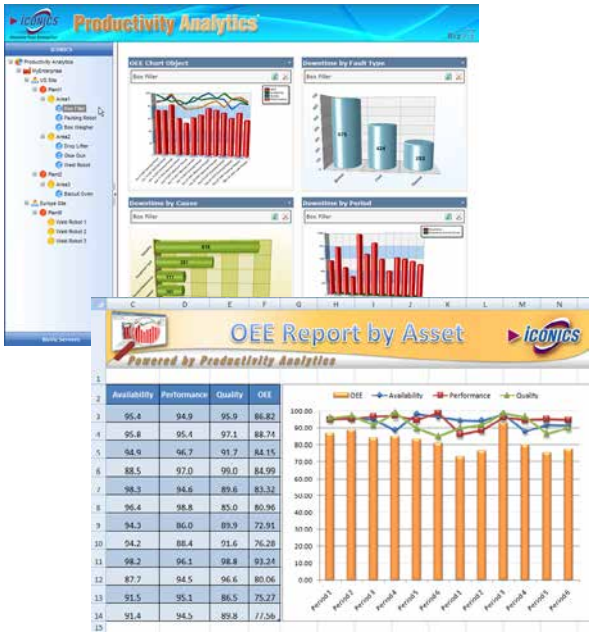
BizViz™ translates manufacturing data from the plant floor into actionable intelligence for decision makers at the enterprise level, integrating data from multiple data sources into visual summaries through powerful dashboards and reports.

Productivity Analytics

Productivity Analytics™ empowers decision makers at all levels of the enterprise with real-time and accurate information to help drive global operational efficiency and strengthen competitive market advantage. Gain insight into OEE, cycle time, yield and many more KPIs. Visualize, analyze and report on any browser or mobile device.

Alarm Analytics

Alarm Analytics™ provides insight into alarm frequency, statistics, user acknowledgements, priority distributions and hidden correlations, helping personnel to visualize, analyze, and manage alarm information.



OPC SOLUTION SUITE

ICONICS offers several additional OPC connectivity tools. Standard and Premium servers are available with connections to individual hardware or industry standards.

OPC ToolWorX is an ICONICS offering allowing users to create custom production-grade, OPC-compliant DA, A/E, and OPC XML servers.

Additionally, ICONICS offers several free OPC development tools, including OPC DataSpy and OPC Simulator. For OPC specifications, please go to **www.opcfoundation.org**. To download any OPC tools, visit **www.iconics.com/Home/Products/OPC-Connectivity/Free-OPC-Tools**, compliments of ICONICS.

Free OPC tools include:

- OPC Modbus Serial Server
- OPC Modbus Ethernet Server
- OPC Simulator Server
- OPC Data Spy – Version 9.01
- OPC Enabled Gauge ActiveX Control
- OPC Enabled Switch ActiveX Control
- OPC Enabled Vessel ActiveX Control

Global Technical Support

ICONICS has created a service and support structure to assist customers and partners with our software solutions. We continually invest in the latest technologies, linking our support and engineering organizations together electronically. When you call our support line, or access our online support portal, you are routed to the appropriate technical experts based on your specific need/topic and the time of day. You will receive the same world-class service from all of our global support offices.

Our support offices are staffed with experts that have immediate access to multiple versions of all of our software products, so we can reproduce the same steps and actions that you are performing. In addition, with your approval, we have the ability to remotely access your system, so that we can observe your operations first hand and can provide hands-on support.

Customers can access support via the communications method that is most productive for them: phone, email or online portal. Those who select our customer portal can access the current status of any issue they have reported and all activity performed on it at **getconnected.iconics.com**.

ICONICS Technical Support Features:

- "Follow the Sun" Telephone Support Option
- 24/7 Telephone Support Option
- Technical Support Centers Around the Globe
- Global Case Tracking System for Easy Access
- Support Options Include: Online, By Phone or Email
- Interactive Case Resolution Via Remote Sessions
- Experienced, Trained Support Staff
- Escalation of Cases As Needed
- Installation/Upgrades/Licensing Assistance
- License Replacement Assistance
- Multiple Software Versions Supported

Customer Connection Portal

The ICONICS Customer Connection Portal is a one-stop online resource for all your support needs. At the Customer Connection Portal, you can search the ICONICS Knowledgebase, review Application Notes, watch "How To" videos, engage with the Customer Forum and Blog, download software updates and view Frequently Asked Questions. You can even see your active SupportWorX Plans and support cases.

The Customer Connection Portal complements our telephone support and gives our customers and partners the ability to communicate with ICONICS and to collaborate with peers. You will also have direct access to many of the resources used by our technical support and professional services staff.

Visit **getconnected.iconics.com** to get started today!

ICONICS Customer Connection Portal Features:

- Extensive Knowledgebase
- Broad Range Search Engine
- Product Feature Training Videos
- "How To" Videos
- Access to "My Support Cases" for Current Status
- Review Open Items for You or Your Customers
- Forums and Connection to Other ICONICS Users
- Software Updates and Service Packs
- Full Release Downloads and Hot Fixes
- Sales Support Information
- Tips of the Day
- News
- FAQs

Consulting Services

There are times when applications require design, implementation or specialized startup assistance. In these situations, you can work directly with our highly skilled applications engineers at our Global Support and Service Centers. Our applications engineers have extensive experience implementing customer solutions with our many products. Our professional service team offers proof of concept design assistance, problem solving, expert technical support and a collaborative effort between the end user, the system integrator and ICONICS' engineering staff.

QPS Services are provided to complement and support the strong engineering capability of our Systems Integrators and Distributors.

QPS is purchased on a Time/Expense basis or a Fixed Price/Delivery of Scope of Work basis. Typical uses for this service include: system architectural design guidance, custom development and scripting assistance, startup assistance, custom training, proof of concept demonstrations and additional resources to help meet critical project schedules.

Quality Professional Services Features:

- Well-trained Application and System Engineers
- Provides Back-up for Tight Deadlines
- Assures that Systems are Properly Designed
- Guidance on Most Efficient User Strategies
- Teaches ICONICS' Product Features Capabilities
- Configuration Assistance
- On-site/In-house Services

Training

An investment in ICONICS Training will result in reduced engineering costs and greatly improved system designs. Active learning is our goal. No matter what your skill level, we offer training courses that fit your needs. Upon completion, you will have the skills for success.

You will be led by ICONICS expert instructors who are dedicated to providing the highest quality of training and are invested in helping you measurably improve your ability to deliver outstanding results. ICONICS training classes are packed with hands-on, in-depth interactions with our products. Tips and shortcuts offered by ICONICS' expert instructors will help you develop your applications quickly and efficiently.

ICONICS Training Features:

- Globally Scheduled Classroom Training – our computers or yours
- Extensive Training Books & Class Materials
- On-site Training with Customer Specific Content

Certification is offered to any student who successfully completes an ICONICS provided training course. Training Certification is essential to ICONICS Channel Programs, such as our System Integrator Program and Distributor/Representative Certification Programs.

Seven official Global Training Centers located around the world offer an array of training courses on ICONICS products including GENESIS64 Suite, Hyper Historian, MobileHMI, IoT, Fault Detection & Diagnostics, Energy AnalytiX, Business Visualization, and GENESIS32 Suite. Contact ICONICS Training or any sales representative to schedule a customized training to fit your organization's exact needs. Custom training can be provided at one of our facilities or at one of yours.

All courses are a combination of lecture and hands-on training. What you develop during training goes home with you, along with a copy of the documentation for future reference.

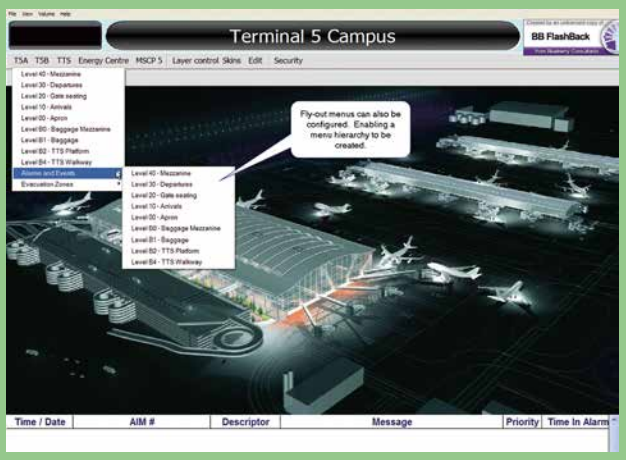
"We have used ICONICS software products almost exclusively on our installations since 1991. Their consistent high performance and value are always major factors in the success of our projects. The versatility and fully customizable nature of the software allowed us to adapt perfectly to the varied technical issues we encountered on the Solebury campus and to precisely tailor the HMI to fit the needs of their personnel."

Walter L. Horigan
President
Vortechs Automation, Inc.

ENERGY SMART BUILDINGS

BAA / Heathrow Airport
Middlesex, United Kingdom

Entrance to T5 Terminal
Heathrow Airport



A Control Screen at T5 Terminal at Heathrow

About BAA / Heathrow Airport T5 Terminal

The T5 Terminal at London's Heathrow Airport was one of Europe's largest construction projects, funded by BAA at £4.2 billion. Initial planning for the facility, with a planned capacity of moving 30 million passengers a year, began in 1985 leading to a national design competition in 1989, then a four-year public inquiry, the longest ever on record. Permission was granted in November 2001 to begin development, a major step in providing BAA its first new gateway at Heathrow since Terminal 4 opened in 1986. Construction of T5 remained steady and on time as the terminal's March 30, 2008 opening day approached. BAA sought a comprehensive solution to deliver a very intelligent control room to operate the new T5 Terminal.

ICONICS Software Deployed

ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite was selected by Ultra Electronics Airport Systems, a "first-tier" supplier for T5's Building System Integration (BSI) and the BAA Systems Team.

Project Summary

The new terminal was designed to be a fully integrated facility, monitored through a central Terminal Service Centre (TSC) and mobile devices. A common user interface was needed to access heating, ventilation, lighting, fire, elevator, CCTV, and security systems as well as to centralize alarm management and automate system interaction.

At its opening, T5 included over 50 different systems, producing a massive tag count of over 3 million, handled easily due to the robust nature of GENESIS32. In addition, by using open industry standards based on OPC, the resulting architecture has been designed to provide flexibility for future expansion and integration, as required by the customer.

Benefits of the System

The ICONICS platform as implemented by Ultra provides better information to the users than any previously designed model, allowing the terminal operators to respond more quickly to changes and situations. It provides a global view of all operations within the building and allows drill down, by pan and zoom, to any asset or area of interest.

Allowing connectivity with many industrial devices and control systems through a common interface, OPC was fundamental to achieving seamless integration within the BSI and giving users the ability to both see and react to cause and effect within the terminal. One extremely important feature was future flexibility in both technical and operational spheres. During the selection process, this was a strong driver for Ultra's and BAA's selection of ICONICS as the core of the BSI.

Conclusion

ICONICS, one of the world's largest suppliers of controls software front end packages, clearly demonstrated a defined development path and road maps designed to keep their product at the forefront of the market and deliver an extended, useful lifecycle of their solutions for BAA.

Baggage Claim at Heathrow Airport's T5 Terminal

Heathrow Airport's T5 Terminal

Case Study Details

BAA and Ultra Electronics Airport Systems brought ICONICS on board due to several factors, including:

Minimizing Risks

- Development of standard symbols/properties
- Consistent Tag structure and display creation
- Minimum number of interfaces

Meeting Requirements

- Flexibility in using BSI in an airport terminal
- Simple maintenance via off the shelf product
- Complex functionality via point and click

Details Continued

Keeping Pace with Industry Developments

- Open industry/IT standards (SQL, OPC, OLEDB, XML)
- Deployment on Microsoft OSs and Internet Explorer
- Mobile Device Integration

Brézillon
Margny-lès-Compiègne, France

Brézillon Headquarters in Margny-lès-Compiègne, France

A Brézillon Building Control Screen Created with GENESIS64™

About Brézillon

Brézillon, an affiliate of Bouygues Bâtiment Ile-de France, is an industrial civil engineering, construction management and rehabilitation company located in Margny-lès-Compiègne, in the Picardy region of France. Founded in 1920 by André Brézillon, it became the first construction company in Picardy in 1945, joining the Bouygues group in 1993 as a general building division.

ICONICS Software Deployed

Brézillon, working with system integrator, CR System of Pointoise, France, and design consultant, BETHIC of Enghien Les Bains, France, selected ICONICS' GENESIS64™ HMI/SCADA suite, including AlarmWorX64™ Multimedia distributed, enterprise-wide alarm notification system and WebHMI™ Web-based, real-time automation. The company also selected ICONICS' ReportWorX™ real-time reporting, charting and analytics software.

Project Summary

Brézillon was tasked with the design and construction of a building compatible with the ideas of the Grenelle de l'environnement, a French consortium of government, labor, industry and other related organizations with the goal of improving ecology, energy, sustainable development and territorial planning. An edict for the building was that it must be built with respect for environmental quality and safety, with the means to monitor and regulate facilities automatically in order to reduce energy costs.

The construction company, working with CR System and BETHIC, had a development time of 14 months, including finalizing electric work and an automated HVAC system. The selected building automation control was meant to tie into multiple procedures and equipment, including:

- Production of calories/kilocalories via two heat pumps (air/water)
- Production of high yield energy recovery (78%) via rotary-equipped CTA turbofan
- Terminal heat treatment via chilled beam induction and motorized air dampers
- Housing of local solar energy controls
- CO_2 presence detection/rate metering and window controls
- Automatic monitoring and regulation
  - o More than 2,400 checkpoints (CVCD/CFO/plumbing)

- Control of energy performance: 102 electrical meters and hydraulic energy

Benefits of the System

ICONICS GENESIS64 was installed to meet several of Brézillon's requirements, including the ability to handle over 4,000 data points (including SAIA controls), integration with BACnet, ModBus and OPC communication infrastructures, and compatibility with Microsoft Windows®. The ICONICS software adheres to the consortium's environmental goals, provides diagnostics and support, and helps maintain comfortable conditions for occupants. Brézillon has found the software to be a user friendly, intuitive, open, scalable and comprehensive building automation management tool. The customized graphical development through GENESIS64 allows non-technical users to be able to easily control their workspace environment. A panel-based PC at each office entrance allows occupants to control the temperature. With one click, a user can display current temperatures and can regulate any setpoints. In line with the company's energy awareness initiatives, the system can also show which windows are open to help users decide whether additional air conditioning is needed. In addition, any supervisor-level changes are automatically reflected on the panel PCs.

Brézillon, CR System and BETHIC selected ICONICS for its ability to provide a Thin Client that was flexible in its integration with other building management system variables. The construction company received a user friendly, intuitive solution with high quality graphic user interface controls. Development with GENESIS64 was considered "strictly tailored to the customer needs".

Conclusion

ICONICS was able to help Brézillon, CR System and BETHIC meet their Grenelle de l'environnement compatibility requirements. Future plans include expansion of the system into energy monitoring and preventive maintenance, with the goal of reducing energy consumption and greenhouse gas emissions.

Building Temperature and CO2 Monitoring

Air Exchange, Blowers, Dew Point Monitoring

Case Study Details

Brézillon and CR System selected ICONICS software for their building controls solution due to:

- Ability to Handle a Large Number of Data Points
- Integration with BACnet, Modbus and OPC Communication Infrastructures
- Quick, Intuitive Use by Non-Technical Users
- Integration with Microsoft Technologies
- Scalability for Easy Expansion
- ICONICS' Shared Adherence to Environmental Policies and Goals

Culoz Countryside in France

CIAT
Culoz, France

Operations Overview

> *"To summarize ICONICS, I would say they were professional, responsive and competent."*
>
> **Eric Blancard**
> Project Manager
> CIAT

About CIAT

Situated in the Rhone-Alpes region of France in Culoz, CIAT has been an expert producer of air conditioning, refrigeration and heating units for 80 years. CIAT also leads the market in sustainable solutions related to heat exchange and air handling and continues to be a trusted resource for comfort, air quality and energy optimization. A company dedicated to the environment and in using energy wisely, all of CIAT's products and facilities are in accordance with the provisions of the Grenelle Environment Round Table.

ICONICS Software Deployed

CIAT implemented ICONICS' GENESIS64™, ScheduleWorX™, BridgeWorX™, WebHMI™ and OPC Server, along with Microsoft SQL Server 2008, across their entire building following a three month pilot program.

Project Summary

In 2013, CIAT employed a workforce of 2,100 people (1,150 in the Rhône-Alpes plants) with a turnover of 256 million Euros. Keeping a steady workforce was an important piece of the upgrade to CIAT. Protecting the environment and using energy wisely were two other components CIAT vowed to never compromise on, and pledges that these are still core business values. Its development subscribes to optimizing energy consumption, improving air quality and ensuring a comfortable atmosphere inside buildings, while providing the best support available to clients.

Self-described as a company dedicated to the world around them, it is essential to CIAT to stay current with cutting-edge industry trends and research. Due to these priorities, CIAT decided it was time to investigate 64-bit monitoring systems that aligned with their values for innovation and sustainability. This search ultimately led them to ICONICS due to

their best in class 64-bit solutions, Microsoft Gold certification, and their Web-client connectivity, as well as the scalability of the solution. CIAT was also impressed with the unification and standardization of communications with all their equipment (e.g. meters, compressors, etc.) through OPC technology. ICONICS software provided the ability to integrate information from a broad range of equipment and systems used without breaking existing connections. "Today we must design living and working spaces that are safe, comfortable and sustainable," said Eric Blancard, CIAT's Project Manager. "CIAT is strongly committed to environmental protection and has made this concern an integral part of its development strategy. CIAT's expertise is based on three fundamental axes: air quality, comfort and energy optimization."

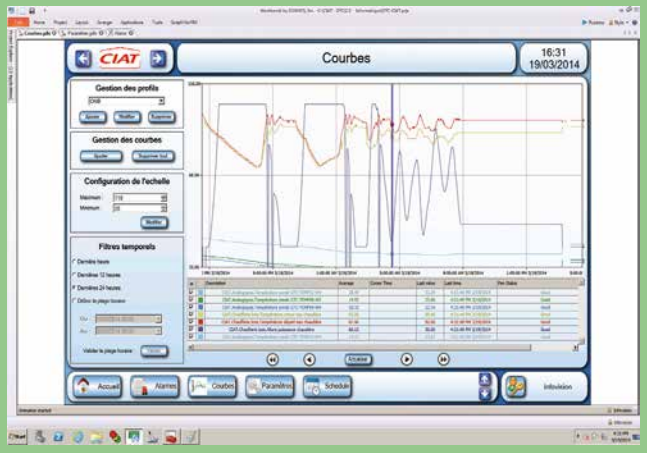
Luckily, ICONICS' values and software fit perfectly into these priorities.

In initial planning meetings, CIAT broke the implementation process out into phases. The first involved laying the foundation of the solution, (including designing the hardware and software architecture). Then CIAT began the implementation of ICONICS software and rolled it out across the entire facility over the course of one year. The CIAT Group has six industrial plants based in France (with four plants, three of which are located in Rhône-Alpes), Spain and Italy. With one server and 500 tags, the project modernized the way that CIAT had been operating.

System Benefits

With seven buildings of 92,000 square meters of office and production space, CIAT used ICONICS to centralize the Culoz Servers, access data remotely via Ethernet, view monitoring and consulting reports via the Web, and control devices on a set schedule. They were also able to reach their sustainability goals through ICONICS' 64-bit technology. Using OPC technology, CIAT can now interface with Mobicall, Europe's leading unified event communication service, as well. CIAT was very pleased with the tremendous success of the ICONICS system.

GENESIS64 Dashboard



Energy Monitoring Screen

Conclusion

After the project concluded, CIAT analyzed their initial goals and evaluated, based on data and surveys, how well ICONICS' solutions met their expectations. The results made everyone very excited. Not only had the project goals been met, but CIAT found the system easy to configure and operate as well.

Thanks to ICONICS' GENESIS64, CIAT has high hopes of running an environmentally friendly, low-impact operation and has plans to add Energy AnalytiX® to various locations to improve their energy consumption and conservation even further.

A View of the Federation Tower

Federation Tower / ARMO Group
Moscow, Russia

HMI/SCADA In Action at the Federation Tower (West)

About The Federation Tower / ARMO

The Federation Tower in Moscow, Russia is to become the tallest building in Europe, as well as Europe's first "Supertall" building. The complex is divided into two towers with a shared podium with a combined floor area of 423,000 square meters. Tower 1 is 360 meters and 93 stories tall with 207,000 square meters of floor space and is to be used primarily as office space. Tower 2 is 242 meters and 62 stories tall with 110,500 square meters of floor space and will be used as a hotel and residential apartments.

At the top of both towers, there will be a 360º-view observation deck and restaurant. Eight above-ground floors and one underground floor will contain over 50,000 square meters of shopping space. When completed, the complex will feature the world's tallest spire, soaring up to over 506 meters and will have the world's highest glass elevators, ascending at a rate of 18 meters per second.

The building automation and security systems in the West Tower are being handled by the ARMO Group, a building systems, automation and management firm also located in Moscow.

ICONICS Software Deployed

Planners for the Federation Tower and consultants from the ARMO Group suggested an OEM version of ICONICS GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite. Johnson Controls, Inc. (JCI) utilizes GENESIS32 technology within its Metasys® M5 Workstation building management system.

Project Summary

Construction on the Federation Tower began in 2005 and will be complete in 2013. ARMO Group is assisting with the JCI building controls and automation network in the West Tower, handling over 21,000 data points spread amongst 1,600 automated devices and using more than 20 digital integrations.

Among the systems now integrated with JCI M5 (ICONICS GENESIS32) are HVAC, Water Supply, Cooling Center, Heating Center, Electrical Transformer Substations, Electrical Distribution System, Uninterruptible Power Supplies, Diesel Generators, Fire Alarm System, Lighting Control, Elevators, Apartment/Room Control, Common Area Microclimate, and Central Dispatching Room.

Presently, the project encompasses over 41MVA of electrical power, 5.7 and 3.8MVA of backup DGU power, 35MW of cooling and 42.5 Gigacalories of heating. Over 40 JCI Network Controllers (NCMs) are utilized along with over 300 Echelon Lonworks® Field Level Controllers. There are seven stationary building control/automation management workstations throughout the West Tower as well as two portable workstations. All workstations in the Central Dispatching Room are connected to a multi-functional video wall, consisting of 96 high-contrast plasma panels. Throughout the year, all information about trends, alarm lists, access lists, etc., is archived to two clustered servers for network storage and can be accessed online at any time based on access permissions. Among the protocols used throughout the network are LonWorks, N2 Open, Modbus and BACnet. In fact, the JCI-networked West Tower is able to communicate with the Sauter-networked East Tower via BACnet integration.

Benefits of the System

The JCI M5 Workstation OEM version of ICONICS' GENESIS32 HMI/SCADA suite provides multiple benefits including scalability as the system grows, wide integration (via BACnet, OPC, etc.), enhanced graphic visualization, Web accessibility, and more.

Conclusion

The group managing the Federation Tower is planning on upgrading their building management system, increasing to 50,000 data points, easily manageable with JCI M5 (ICONICS GENESIS32).

The Federation Tower Under Construction
Moscow, Russia

The Building Control Center Inside
the Federation Tower (West)

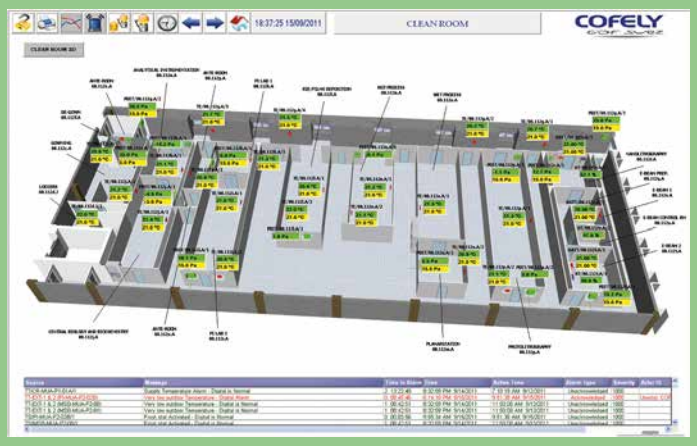
Case Study Details

ICONICS provides the ARMO Group with a solution that includes:

- Scalable, Fault Tolerant Workstation
- Dynamic, High Quality Graphic Capability
- GUI Personalization by User/User Type
- Trend Collection, Storage and Analysis
- Interface Between Integrated Systems

International Iberian Nanotechnology Laboratory
Braga, Portugal

The International Iberian Nanotechnology Laboratory (INL), Braga, Portugal



Clean Room Floor Monitoring/Control

> *"So far we have been working with GENESIS32 for five years. Our experience during this time has been excellent. That is the main reason why ICONICS is always our first choice when selecting which SCADA to install."*
>
> **José Granero Nueda**
> Project Manager
> Cofely GDF Suez (España)

About International Iberian Nanotechnology Laboratory (INL)

The International Iberian Nanotechnology Laboratory (INL) (http://inl.int), located in Braga, Portugal, is an intergovernmental organization created to foster interdisciplinary research in nanotechnology and nanoscience. Aiming to become a vital part of Europe's scientific area, INL provides a high-tech research environment addressing major challenges in nanomedicine, nanotechnology applied to environmental and food control nanoelectronics, as well as nanomachines and molecular manipulation at nanoscale.

With a total area of 28,000 square meters, the INL will house more than 200 top level scientists and about 100 PhD students, besides the laboratory support and administrative personnel. Main outstanding spaces of the building included:

- A clean room space with a total area of 1,050 sq. meters, which is divided into 7 big labs that house 19 different spaces, six of them classified at ISO5 and the rest at ISO 6.
- 11 high accuracy rooms; three of them fully shielded to attenuate the electromagnetic interferences with an attenuation of up to 120 dB, with a total area of 700 sq. meters ($m^{2)}$.
- 23 wet laboratories with a total area of 1,000 m^2.
- 23 dry laboratories with a total area of 1,000 m^2.
- 6 biology laboratories with a total area of 170 m^2.

ICONICS Software Deployed

The INL, working with Cofely GDF Suez (España), selected the ICONICS GENESIS32™ HMI/SCADA software suite for their new Building Management System integration project.

Project Summary

In 2009, a consortium where Cofely was involved was awarded a €42 million contract for the construction of all the installations of the INL in Braga, Portugal. The complex is divided into a hotel for resident researchers and the main building, where clean rooms, laboratories, high accuracy areas and administrative offices are located. The application involved deploying an ICONICS-integrated Building Management System, paying special attention to the clean room and high accuracy and laboratory areas, as well as to the critical process systems.

beginning, implying additional and unacceptable costs. On the other hand, the HVAC system for these areas was designed to work 24 hours a day and 365 days a year. In addition to the temperature, humidity and pressure data monitoring and collection for the certification of the clean rooms, it was an additional challenge to control the temperature in the high accuracy rooms with a required accuracy of ±0.1ºC.

The control system is based on B&R's X20 series. The main control tasks are handled by over 100 control cabinets with their respective B&R controllers. Besides the main controllers, over 60 Beckhoff

A Laboratory at the INL

Air Handler Operations for the Connected Hotel

The Building Management System was designed to control and monitor the following systems: HVAC, Hot Water Production, Chilled Water Production, Low Temperature Chilled Water Production, Process Chilled Water, Ultrapure Water, Vacuum, Compressed Air, Acid Waste Neutralization, Flammable/Toxic Gas Detection, Fire Detection and Smoke Exhaust, Electrical Transformer Substations, Natural Gas Detection, and Liquid Leak Detection. There are over 14,000 total I/O points in the facility.

Critical areas such as clean rooms and high accuracy labs don't allow any downtime for the HVAC system, because most of the experiments carried out in these zones are expensive and take a long time. Should any failure occur while an experiment is being carried out, it would have to be started from the compact PLCs, acting as Modbus TCP slaves, are utilized to control the variable volume boxes located in the conventional areas. B&R (communicating via B&R OPC Server) and Siemens and Omron PLCs (communicating via Kepware OPC Server) were provided by third-party special equipment manufacturers together with their systems and communicate with each other and with the OPC Servers. These are hosted in the same server as the GENESIS32 server via a dedicated Ethernet LAN.

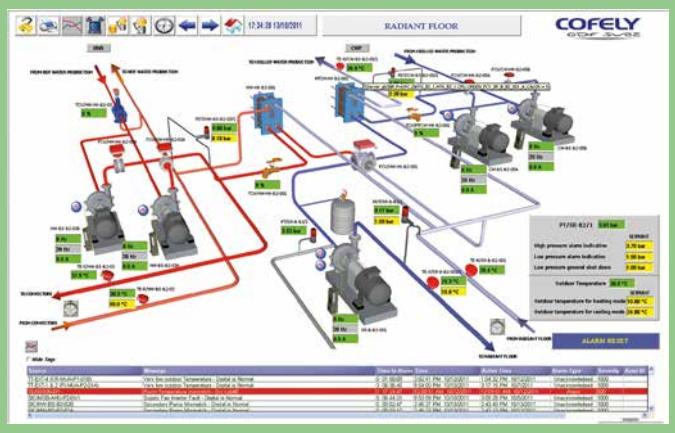
The whole system is synchronized with a SNTP server, also hosted in the GENESIS32 server. The Fire Detection System was also integrated, via Modbus TCP OPC Server, within GENESIS32.

Continued on the next page...

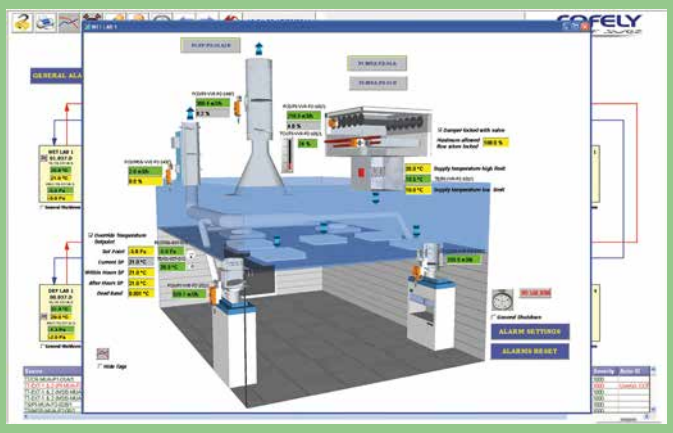
In addition, Cofely plans to install ICONICS WebHMI™ and AlarmWorX™32 Multimedia, as the functionalities provided by these tools have been required by the client.
Main historical data, alarms and events are logged into SQL databases due to the need for compliance with the FDA 21 CFR Part 11 regulation. Data consistency is a must.

Benefits of the System

The system allows operators to control and monitor the entire complex, following a Web-based look that makes navigation straightforward and provides users with a low technical profile and with instant visualization of the parameters of any equipment or space. More than 700 screens are deployed on the project. In order to provide a friendly designed environment, 3D graphics with animations were developed, making navigation even easier. An audit trail allows recording of the dates and times of all the operator entries and operator actions that create, modify, or delete any parameters or variables. Another important feature is the possibility of customizing reports, presenting either historical data, alarms or events.
Unlike other SCADA packages, with GENESIS32, openness is not merely a word, as the integration of any controller or system based on OPC can be done on the spot. The system is expected to grow in the next years and based on Cofely's experience with GENESIS32, they know that it won't be a problem.
Because of the seamless integration via OPC of the different and heterogenous systems and the user of the Global Aliasing tool, it could be said that, compared to other well-known SCADA manufacturers, GENESIS32 allowed Cofely to reduce development time and therefore the costs by 50 percent.
Among the reasons why Cofely and the INL selected ICONICS GENESIS32 are:



INL's Radiant Floor/Water Production System



Air Handler Operations for the Connected Hotel

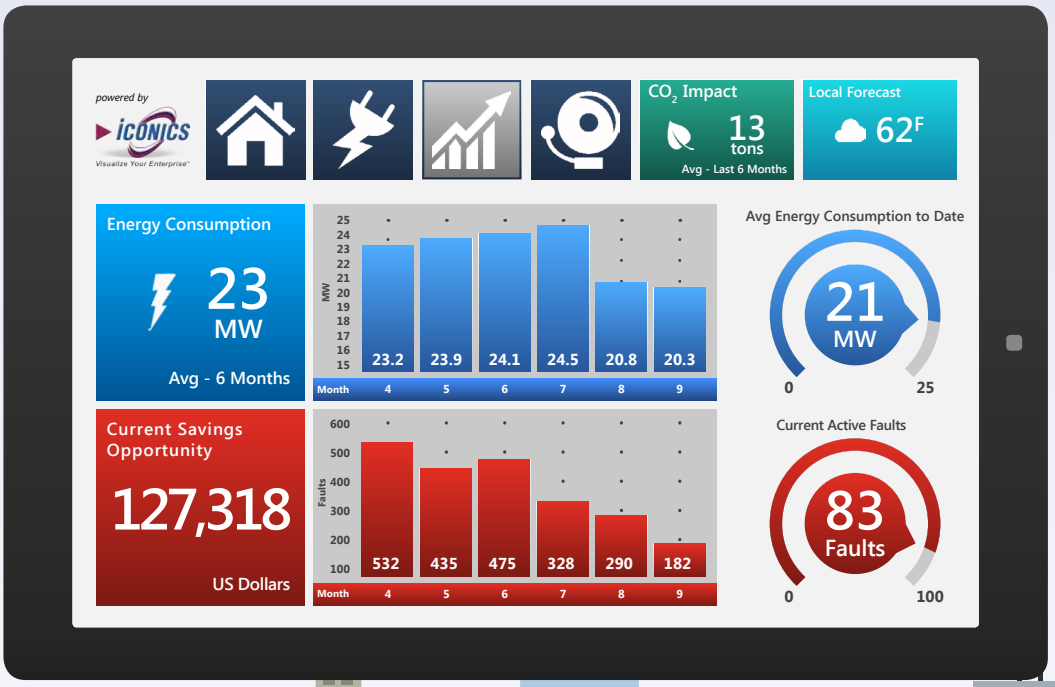
- Past Success Stories and Background with GENESIS32 in Other Building Management Systems for the Pharmaceutical Industry
- Seamless Integration of Any PLC or Controller via OPC.
- Compliance with FDA 21 CFR Part 11
- Free Modbus OPC Server and SQL Server
- Real scalability of the System

Conclusion

Cofely GDF Suez (España) required a comprehensive, state-of-the-art HMI/SCADA system to handle the International Iberian Nanotechnology Laboratory's building management. ICONICS GENESIS32, with its wide data source integration, emphatically passed the test.

Transform Any Building Into a Smart Building

Continuous Commissioning Software Saves Time, Energy and Money!



Energy Smart Buildings

Visualize real-time energy dashboards, scorecards and building metrics to make fast decisions by connecting devices, systems and people. Turn **Big Data** into actionable information.

Fault Detection and Diagnostics

Analyze and predict equipment faults and energy use with over 300 proven rules. Perform real-time **continuous commissioning**, reduce energy costs, improve occupant comfort and be more sustainable.

Mobile Productivity

Mobilize your work force and deliver information to smartphones, tablets or browsers. Using an **Azure**-based cloud solution, securely connect to building metrics, anytime, anywhere.

Visit ICONICS at: **www.iconics.com/fdd**

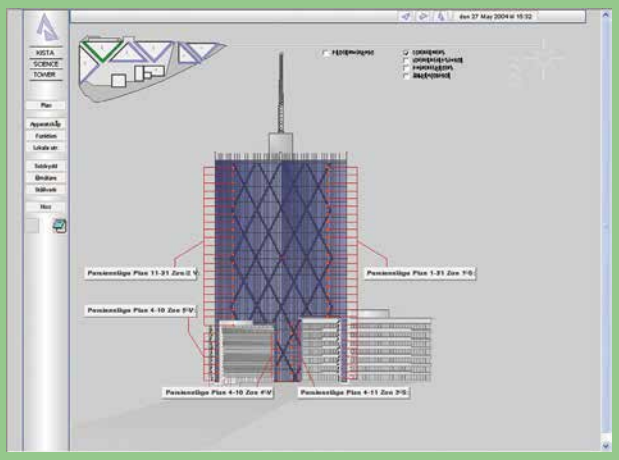
VISUALIZE | HISTORIZE | MOBILIZE | ANALYZE | CLOUD IoT

Winner
Microsoft Partner
2017 Partner of the Year
Application Development Award

ICONICS
Make the Invisible Visible™

Kista Science Tower
Stockholm, Sweden

Kista Science Tower
Stockholm, Sweden



Window Blind Control Screen

> *"ICONICS software has enabled us to build an independent open system for the Kista Science Tower. The GraphWorX design application in GENESIS32 allowed us to create rich graphics and we were able to take advantage of reusable graphic components".*
>
> **Joakim Platbarzdis**
> Integrator
> CIT Sweden AB

About The Kista Science Tower

The Kista Science Tower complex is comprised of six buildings, with the tallest spanning 32 stories. This state-of-the-art complex is located in one of the most dynamic IT regions in the world. Each floor of the Kista Science Tower houses approximately 700 square meters of office space. The glass frontage gives this tower an attractive look and plenty of sunlight for tenants, including Network Services, Unisys, Symantec and more.

ICONICS Software Deployed

GENESIS32™ is used to monitor and control the KONE elevators, lighting, HVAC and the window blinds for the Kista Science Tower. OPC-to-the-Core™ technology is a key component of these high-profile automation applications. Control Integration Technology, Sweden AB was the main integrator for Johnson Controls working closely with NCC construction. Having OPC connectivity native to GENESIS32 made it the premier choice for visualization. AlarmWorX™32 Multimedia and WebHMI™ are also in use. WebHMI™ provides full read/write access remotely via any standard Internet Explorer. AlarmWorX Multimedia is responsible for serving all alarms in real time to those who need them.

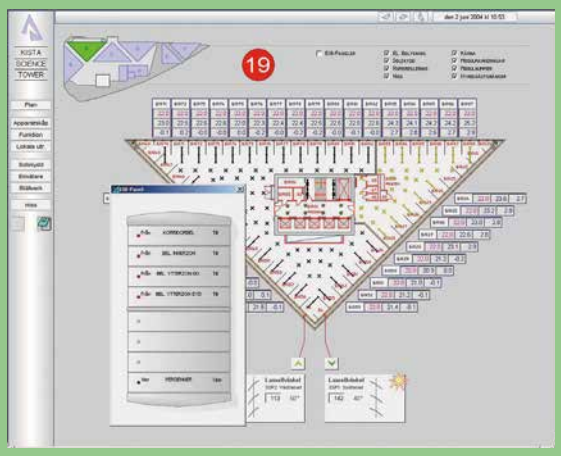
Key Features

The biggest challenge was to have an open infrastructure where all monitoring and control could be looked at as a single system. OPC fits this model very well. With OPC as the open architecture, this allows, for all systems and controllers, a common platform for communication. Since OPC is used, all systems can be monitored by ICONICS. GENESIS32 can connect

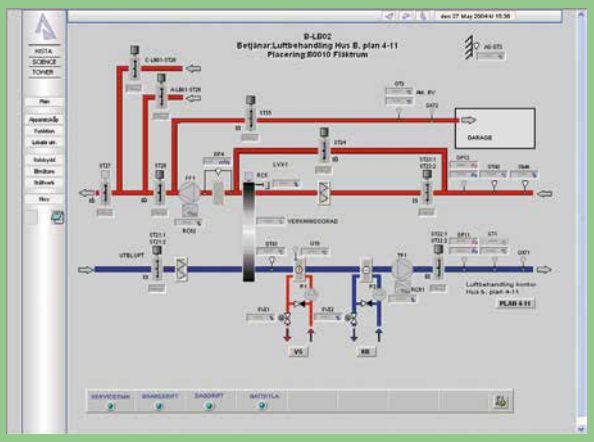
to any OPC server throughout the Kista Science Tower. This connectivity includes communication to the KONE OPC-DA server running on Linux. GENESIS32 components, such as DataWorX™32, AlarmWorX™32, and TrendWorX™32, are bridged to the Linux server through a separate Windows Server. Other OPC connectivity from GENESIS32 includes connections to Johnson Controls and Schneider Electric devices.

event of an emergency, the blinds are automatically opened and the awnings are pulled back within minutes. The KONE elevators are continuously monitored for power failure, fire, or other faults by the GENESIS32 system. A visitor control system is also built into the operation of the elevators. Visitors to the Kista Science Tower are given a programmable access card. This card only allows access to the floors the visitors need to access.

OPC connectivity is provided from GENESIS32 to Johnson Controls, Schneider Electric, and EIB hardware. There is also an OPC bridge to the KONE



Kista Science Tower Floor Control Screen



Air Circulation Handling Controls

Project Summary

GENESIS32 is connected to a weather station that continuously monitors the intensity of the sun. This data is used to control the angle of the blinds and awnings for the entire building. OPC data from the JC.N1 OPC Server connects via DataWorX32 to the CCEIB OPC server to send the proper setting to the blinds. Three times a day, the angle of the blinds is adjusted based on a calculation determined from the sun's intensity, time of year, and building zone.

In addition to keeping the office workers comfortable, the blind-control system saves on heating and air conditioning. The control of the blinds and awnings is also connected to the fire system. In the elevators. Total I/O points exceed 15,000 tags Microsoft SQL Server is used for all data logging. In total, 2,400 rooms are controlled with 25 network controllers and 18 control cabinets.

Conclusion

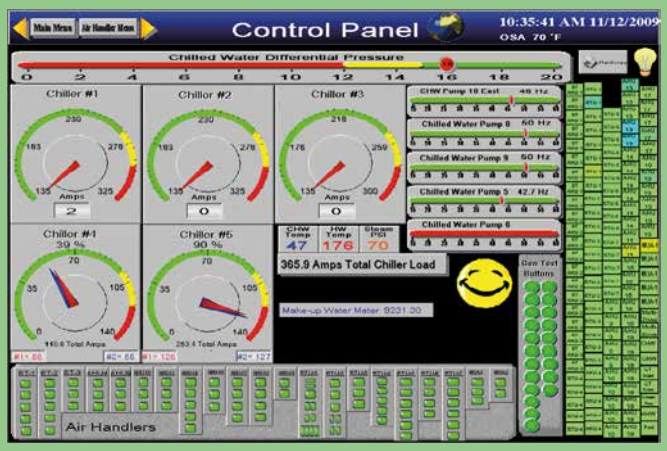
Future development plans are underway to allow building occupants to view the status for their own part of the building.

Longmont United Hospital
Longmont, Colorado

LONGMONT UNITED HOSPITAL

RSI COMPANY

Longmont United Hospital



Longmont United's Self-built Control Panel

"ICONICS software has been an evolving tool for our facility moving from simple graphics to intricate screens in our decade long relationship. It allows facility mechanics to monitor, control, and adjust most systems throughout the campus. We pride ourselves on reacting to and correcting issues before they are ever realized by our customers. ICONICS software is "the" tool that makes it possible. From our panic buttons and therapy pool to our air handling units and emergency power generators, ICONICS helps our daily mission be a successful one."

Robert Smith
Building Services Manager,
Longmont United Hospital

About Longmont United Hospital

The city of Longmont, Colorado, boasts 300 days of sunshine a year, beautiful views of the Rockies and the world-class Longmont United Hospital. The philosophy that healthcare extends to the patient's spirit, mind, body and family pervades Longmont United's services and facilities. Rated among the top 10% of hospitals for patient experience in the United States, Longmont United is a wonderful place to get well.

In January 2000, Longmont United opened a five-story patient tower with new private rooms and soothing environments for patients and their families. Services such as complementary therapy and dedicated departments including a Birth Center, Cancer Center, and Women's Imaging Center reveal commitment to compassionate care. This spirit is further reflected in the hospital's building management system, where ICONICS software allows operators to monitor, control and adjust multiple systems for maximal patient comfort and efficiency.

ICONICS Software Deployed

Longmont United Hospital uses GENESIS32™ WebHMI for their facilities management system. AlarmWorX™32 Multimedia delivers real-time alarm notifications to plant operators, while TrendWorX™32 functions as the hospital's

data collecting, logging, charting, reporting and analysis system.

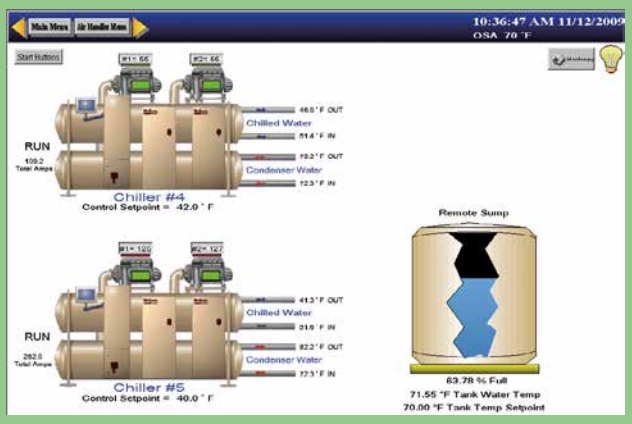
Project Summary

ICONICS and Longmont United Hospital have grown together over the years. Just as healthcare has advanced, Longmont United has expanded and updated its facilities, and ICONICS' technologies have evolved. Longmont United has been quick to upgrade to ICONICS' latest innovations, and a long lasting relationship has developed into a superior building automation and monitoring solution.

Benefits of the System

At Longmont United Hospital, ICONICS is implemented even at the patient level. Climate control is put in the hands of the patients, and panic buttons at various "at risk" locations throughout the campus connect to the self-monitoring alarming system. When a panic button is pressed, appropriate personnel are notified via pager and cell phone.

GENESIS32 has proven to be an effective teaching tool for Longmont United's facilities department. Quality graphics offer visualization of the facility and can be used to show the exact sequence of operations in any area of the building.



View of a Longmont United Chiller

View of Emergency Generators

RSI Company implemented and integrated ICONICS' software, which provides a customized, state-of-the-art Building Management System to the facilities of Longmont United. GENESIS32 allows maintenance personnel and operators to easily navigate and control key operation parameters in the facility. ICONICS WebHMI offers remote Internet connectivity to Longmont United's system, while AlarmWorX Multimedia provides alerting to facility operators via phone.

The hospital's ventilation and air conditioning, thermal and heating stations, emergency power systems, technical gas systems and other systems specific to healthcare are monitored and/or controlled by ICONICS' automation solution.

Conclusion

With Longmont United's buildings efficiently controlled and monitored by ICONICS, the hospital can focus on its primary concern of providing the best healthcare. GENESIS32's WebHMI capabilities will eventually be leveraged to allow Longmont United's facilities operators to manually respond to alarms and adjust conditions from remote sites.

Malpensa Airport/ Elsag S.p.A.
Milan, Italy

Malpensa Airport
Milan, Italy

SEA's Baggage Handling Client Interface

> *"The customer can easily handle the entire system just by looking at the general overview page and can handle all the commands with confidence. If necessary, they can switch between the two servers without having a temporary loss of communication within the field."*
>
> **Masnata Ivano**
> Project Manager
> Elsag S.p.A.

About Malpensa Airport/Elsag S.p.A./SEA

Elsag S.p.A., a division of FINMECCANICA, provides IT solutions focused on postal, automation, security, industrial and defense systems. It works in tandem with SEA, the company that manages both the Malpensa and Linate airports in Italy, specifically on the Malpensa Airport T1 terminal's baggage handling system. Elsag S.p.A.'s application is used to monitor and control the Handling Baggage Security (HBS) and Early Baggage System (EBS).

ICONICS Software Deployed

Elsag S.p.A. and SEA selected ICONICS GENESIS32™ HMI/SCADA suite including DataWorX™32 OPC data bridging, aggregation and redundancy.

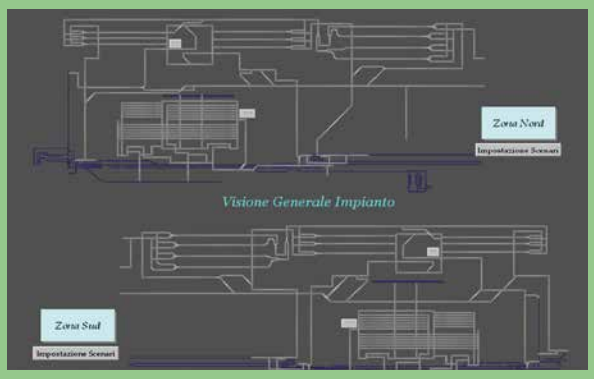
Project Summary

SEA required an HMI/SCADA solution for an in-house data trending application to assist operators with determining the number of baggages processed in defined intervals. The involved system consists of two hot backup servers and 11 clients, used for monitoring the state of the HBS and EBS systems. One server runs ICONICS AlarmWorX™32 (with alarm logger), ScriptWorX™32 and DataWorX™32. Both servers handle client security (aligned between the two servers by means of a script) and can switch automatically if a failure is detected on the primary, or on demand by an operator.

The client interface consists of a main page with all other pages shown concurrently. In this way, the most important required information is constantly represented on screen, including alarm indicators, emergency scenarios, network status (of each PLC or server), reporting, the terminal's Flight Managing System, and login/logout. Selecting one of the

symbols on the general view opens a related page in which each element composing the line is represented. It's possible to open a more detailed page in which each signal related to the element is shown. It's also possible to navigate between different displays (without returning to the general view) via "arrow" navigational tool.
Secured commands can be issued to the PLCs in order to change the working lines of the system. This allows the customer to plan maintenance of the plant, as well as for recovery of faults without affecting the behavior of the entire system.

including the ability to switch between the two connected servers. SEA also values the integration into its Flight Managing System. Configuring the system (displays, alarms, trending) was considered "easy and efficient". Communication between the ICONICS applications and existing Siemens S7-300 PLCs is via an OPC server link by Applicom Cards (two for each server). Integration with the PLCs, the Profibus Remote I/O, as well as with the Oracle DB8 database and Windows 2000 Server and Professional operating systems, is seamless.



Baggage Handling Line Overview

Individual Baggage Handling Line Overview

Key Features

Elsag S.p.A. and SEA had specific requirements in their HMI/SCADA solution for the Malpensa terminal, including:

- Hot Backup Ability
- Extension via Web Interface and Thin Client
- High Quality Graphics and Related Features
- Good Reliability
- Logging and Trending Archive
- Integration with the Terminal's Flight Managing System

Benefits of the System

Malpensa's new ICONICS solutions provide full plant monitoring as well as remote system control,

Conclusion

Elsag S.p.A. and SEA are now able to ensure smooth travel for Malpensa Airport's baggage thanks to the multiple, secure capabilities of ICONICS GENESIS32 and additional solutions.

Solutions Highlighted

DataWorX32
Data Aggregation, Bridging, Redundancy and Tunneling Software

Merrill Lynch
Hopewell, New Jersey

Merrill Lynch Complex
Hopewell, New Jersey

Floor Plan of One of the Merrill Lynch Buildings

About Merrill Lynch

Merrill Lynch is a world-recognized financial management and advisory company, with offices in 37 countries. As an investment bank, Merrill Lynch is a global underwriter of debt and equity securities and strategic advisor to corporations, governments, institutions and individuals worldwide. Merill Lynch required a monitor and control solution at the time for their building campus in Hopewell, New Jersey.

ICONICS Software Deployed

Merrill Lynch selected ICONICS GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite featuring the GraphWorX™32 HMI Graphical Display Package, AlarmWorX™32 Alarm Management System and TrendWorX™32 Live and Historical Data Logging, Charting and Reporting components.

Project Summary

An OEM version of GENESIS32 provides the Building Controls for the Merrill Lynch complex in Hopewell, NJ. There are twelve buildings under the watchful eye of state-of-the-art graphics and alarming.

These ice plants are used as a cost-efficient method for building energy management. They are designed to freeze water at night when electricity is available at a low price. Then, when rates go up during the day, the ice is melted to cool down the buildings, rather than using other methods requiring “instant” energy demand. This “time shifting” of energy usage really helps trim the energy bill.

Operators easily navigate among the various systems used to manage every aspect of the building complex (HVAC, Lighting, Energy, Security, Fire, and other building controls) via the graphics created for the project. There are over 1,000 screens deployed on the project, all of which are accessible with just a few clicks from the menus and control panels designed into the building management system.

Top-notch 3D images representing the equipment used by the project were completed for this application. The project not only offers stunning visual displays, but also follows a Web-motif, making it easy for users to navigate through the system.

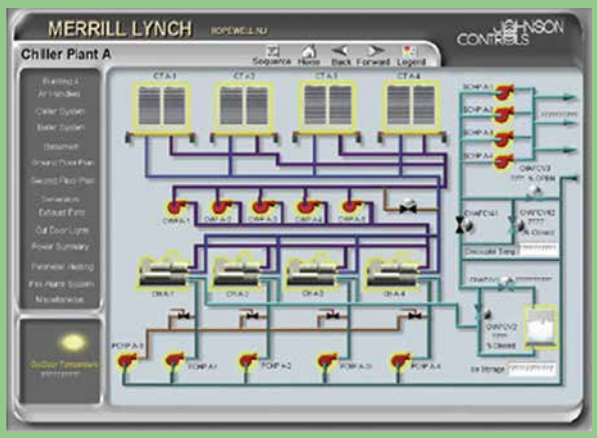
Feedback from the users of the system was very positive. They enjoyed the “realism” of the systems’ representation in the graphics. Clicking on floor

plans and viewing live status information provides the easy-to-understand operations they were hoping for. The graphics also make use of the ICONICS "animators", showing dampers opening/closing, fan blades turning, airflow direction and more.

Conclusion

GraphWorX32 played a critical role in providing a comfortable and safe environment for the people at the Merrill Lynch office complex.

Fan Coil Unit Control in a Merrill Lynch Building



Chiller Plant Controls

Case Study Details

Some unique features of this project include:

- 8 office buildings totaling 1,598,400 Square Feet
- 4 assembly buildings featuring four cafeterias totaling 246,000 Square Feet
- GUI Personalization by User/User Type
- 4 parking garages with a total of 2,594 parking spaces
- Four boiler plants, chiller plants and ice plants

Solutions Highlighted

GraphWorX32
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

TrendWorX
Data Logging, Charting and Reporting Software

Mohegan Sun
Uncasville, Connecticut

Mohegan Sun Casino and Hotel
Uncasville, Connecticut

A Kitchen Control Panel at Mohegan Sun Casino

About Mohegan Sun

Created by the Mohegan Tribe of Indians of Connecticut, Mohegan Sun is a legendary gaming and entertainment destination, renowned for exceptional service, hospitality and excitement. Featuring an extraordinary Mohegan-themed design unlike any other in the industry, Mohegan Sun is one of the most unique casinos in the world.

ICONICS Software Deployed

Mohegan Sun selected ICONICS GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite featuring the GraphWorX™32 HMI Graphical Display Package, AlarmWorX™32 Alarm Management System and TrendWorX™32 Live and Historical Data Logging, Charting and Reporting components.

Project Details

GraphWorX32, a component of GENESIS32, monitors the status of these areas, as well as the chillers, boilers, and other behind-the-scene systems.

The system uses approximately 250 VAV boxes, about 60 air handling units (AHUs), 30 exhaust fans, a dozen fan coil units, and a host of temperature and humidity readings.

An interesting aspect of this project is the AHUs deployed for the arena. There are four fans moving 200,000 cubic feet per minute of air. Normally these are used to air condition the facility for spectators. However, in case of a fire, the smoke detector system puts these AHUs into “Smoke Mode.” Instead of bringing air into the arena, dampers change and these pull the smoke out of the area, making it easier for firefighters to enter the building.

The custom graphic interface that can be developed by using GraphWorX32 gives more knowledge to the user/operator, thus creating an environment for success.

Benefits of the System

Mohegan Sun was able to go beyond just text-based information for operator interactions with the ICONICS-based system. Using this powerful visualization, based on GENESIS32, operators can now visualize the equipment and its operating conditions.

The system follows a “Web-based” look and feel, providing users with an instant understanding of how to navigate through the system. Many have commented on how easy it is to manage the environment.

Conclusion

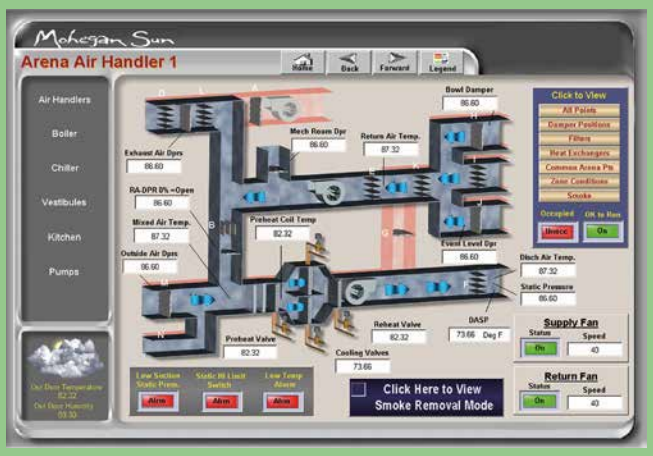
This facility may include a world-class casino, but the customer did not want to gamble on the comfort of their guests. That's why ICONICS GENESIS32 visualization software is at the core of this application that monitors and controls the entire complex.

Deploying state-of-the-art alarming and graphics using AlarmWorX32 and GraphWorX32 provided a "best in class" system for this high-profile project. While your luck at the gaming tables may vary, the management system running this fabulous destination is a sure bet.

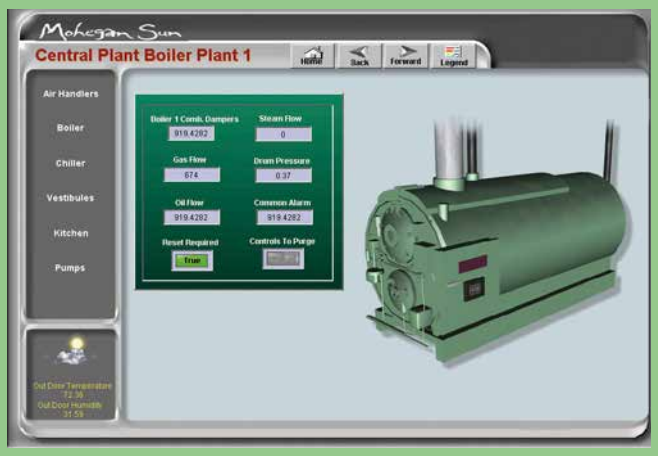
Case Study Details

Mohegan Sun uses ICONICS to monitor and control:

- 60 air handling units
  (In the arena, 4 AHUs move 200,000 cubic feet of air per minute)
- 250 variable air volume devices
- 30 exhaust fans



Air Handling Control System inside Mohegan Sun's Arena



Boiler Plant Control

Case Study Details

Mohegan Sun's grounds include:

- A 34-story hotel featuring 1,176 luxury guest rooms
- 300,000 square feet of gaming excitement
- Thirty-two different dining options
- Over thirty fine shops and boutiques
- A performance theatre and arena
- The Sky Dome - the world's largest, most spectacular planetarium dome, which bathes the casino in an ever-changing display of sparkling constellations

Solutions Highlighted

GraphWorX
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

TrendWorX
Data Logging, Carting and Reporting Software

The MSC Meraviglia

MSC Cruises
Saint-Nazaire, France

A Single Deck's Fire Zones Interface

Monitoring Station aboard the MSC Meraviglia

About MSC Cruises

MSC Cruises (www.msccruises.com), headquartered in Geneva, Switzerland with a shipyard in Saint-Nazaire, France, is the world's fourth largest cruise line and largest privately-owned cruise company, and market leader in the Mediterranean, South America and South Africa. Following several years of unprecedented growth, MSC Cruises sails throughout the year in the Mediterranean, and offers a wide range of seasonal itineraries in Northern Europe, the Atlantic Ocean, the Caribbean, Cuba and French Antilles, South America, South Africa, Abu Dhabi, Dubai and Oman.

The company grew by 800% between 2004 and 2014, carrying 1.67 million guests in 2014 and reported strong financial results with a turnover of €1.5 billion. MSC Cruises is a Swiss-based European company with deep Mediterranean roots employing 15,000 staff around the world and present in 45 countries.

ICONICS Software Deployed

MSC Cruises, working with system integrator, Engie Axima (www.engie-axima.fr) selected ICONICS' GENESIS64™ HMI/SCADA and building automation suite.

Project Summary

MSC Cruises sought a modern monitoring and control system for its latest cruise ship, the MSC Meraviglia. According to a company release, at 171,598 gross register tonnage (GRT) and with guest capacity of 5,714, MSC Meraviglia is both the biggest ship to ever be built by a European ship owner (MSC Cruises) and the biggest to come into service in 2017. The cruise ship, the 13th to join MSC Cruises' fleet since the company's inception in 2003, is 315 meters long, 43 meters wide and 65 meters high and can travel up to 22.7 knots. Among the ship's attractions are a water park with multiple water slides, a Himalayan rope course, a Cirque du Soleil theatre, and the largest LED dome at sea.

MSC Cruises hold the comfort and safety of its passengers as a top priority, which includes the monitoring and management of its ship wide HVAC system. With assistance from Engie Axima, the cruise company selected a system for the Meraviglia that would cover the heating, ventilation and air conditioning throughout passenger cabin, public space, galley, stairway, technical room, swimming pool, and wheelhouse areas. Combined, approximately 450 fans, 820 sensors and 1,000 actuators are now controlled and monitored via ICONICS GENESIS64 software. Approximately 6,000 physical input/output (I/O) points and 15,000 communications I/O points are connected through the system, including interfaces with over 100 SAIA Burgess PLCs. In addition, GENESIS64 also connects to Kepware OPC Server software aboard the vessel.

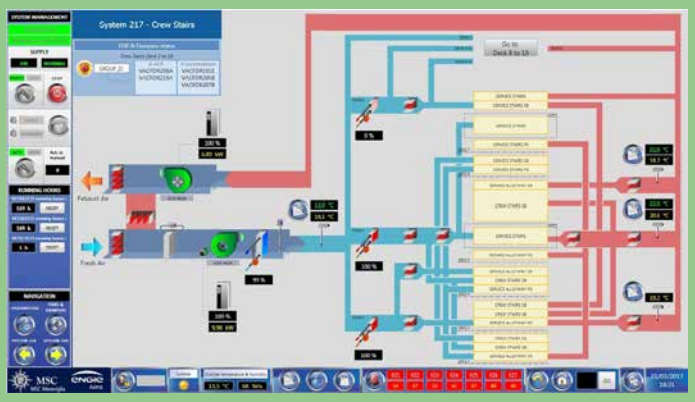
Benefits of the System

MSC Cruises wanted to include the latest technology in its newest cruise ship, not only for the entertainment of its passengers but also for their, and its crew's, personal comfort. Ship wide, the operation of its HVAC system can be easily performed via Web-connected touchpads thanks to the installation of ICONICS GENESIS64 HMI/SCADA software. A detailed, intuitive, easy-to-use interface allows operators to monitor and set temperatures and related parameters throughout the ship.

Conclusion

The MSC Meraviglia was put into server in June 2017. The ship's owners and operators are now confident that, with ICONICS GENESIS64 onboard, the furthest thing from their passengers' minds will be any concerns over heating or cooling.

An MSC Meraviglia HVAC System



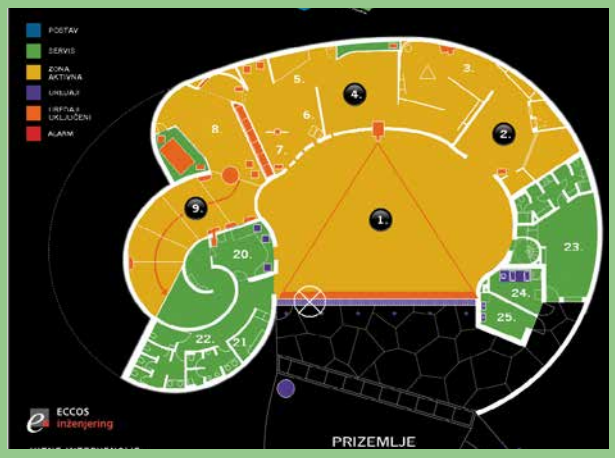
Crew Stairs Air Control Management Screen

A Realistic Exhibit in the Neanderthal Museum
Krapina, Croatia

Museum of Krapina Neanderthals
Krapina, Croatia

MUZEJ KRAPINSKIH NEANDERTALACA
MUZEJI HRVATSKOG ZAGORJA

ECCOS inženjering



Overview of the Museum

About The Museum of Krapina Neanderthals

The Museum of Krapina Neanderthals is located in a glen between two small hills near the modern city of Krapina, in northern Croatia. The museum represents the spectacular Krapina site, where a Neanderthal village was discovered in 1899 by Dragutin Gorjanovic. The archeological site, one of the richest and most heterogeneous in the world, had over eight hundred fossil remains of 75 Neanderthals and their tools and weapons.

Opened in February 2010, visitors to the museum's 1,200 square meter exhibition space experience a simulation of the way of life in a Neanderthal cave 130 thousand years ago. Through touch screens, video-walls and numerous audio, visual and scent installations, visitors enjoy a highly interactive museum experience.

The Museum of Krapina Neanderthals is technologically oriented and extraordinarily equipped for multimedia presentations enabling an engaging visitor experience.

ICONICS Software Deployed

SCADA technology in the Museum of Krapina Neanderthals integrates diversified and seemingly incompatible electronic subsystems of building and exhibit installation components. ICONICS GENESIS32™ HMI/SCADA suite connects and automates the Museum of Krapina Neanderthals' building management systems, security systems and multimedia systems. The museum is enabled with data acquisition and aggregation, analysis and alarming, visualization and real-time status of installations and components. Complete visualization and automation is accessible through a single personal computer with a simplified and reliable graphical interface.

ECCOS inženjering and ICONICS developed a unique solution for visualization and control of the Museum of Krapina Neanderthals, satisfying the needs of the investors, authors and operators of the site.

Project Summary

Harmonious integration, coordination and automation of multimedia components, building management systems (BMS) and security systems defined the specific needs of the project.

Multimedia components comprised of:

- Computers
- Projectors
- MPEG players
- Audio,video and scenting equipment

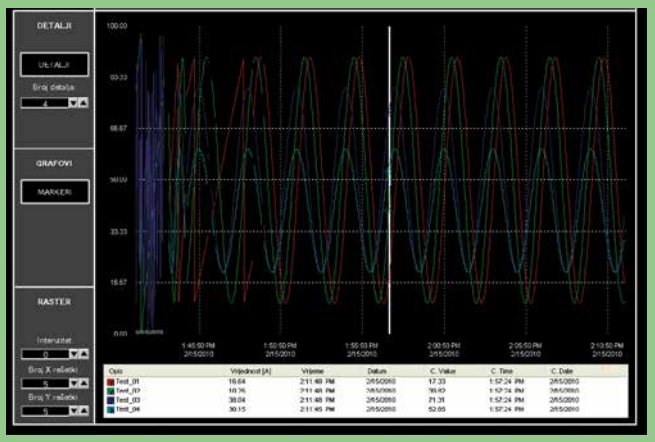
Building management systems (BMS) included:

- Electrical branch circuits and lighting
- Metal curtains
- HVAC Security Systems consisted of:
  - Siemens fire system
  - Honeywell intrusion system

Benefits of the System

While the details of this project affirm the ability of ICONICS and ECCOS inženjering to seamlessly coordinate diverse subsystems, the strength of the project is revealed through control simplification. Automation scripts simplify everyday control reducing a complicated system to several keyboard commands, making the system accessible and controllable for users with little technological knowledge.

Easy-to-identify Symbols Correspond with the Museum's Systems



Trending Display for the Museum of Krapina Neanderthals

At the core of the system, ICONICS GENESIS32, using Matrikon's OPC server and a Schneider Electric M340 PLC, integrates to establish full supervision and control over all the electronic and electrical systems. The vast majority of communication is based on the local Ethernet network, while the PLC is connected with security and BMS systems through digital/analog inputs and outputs.

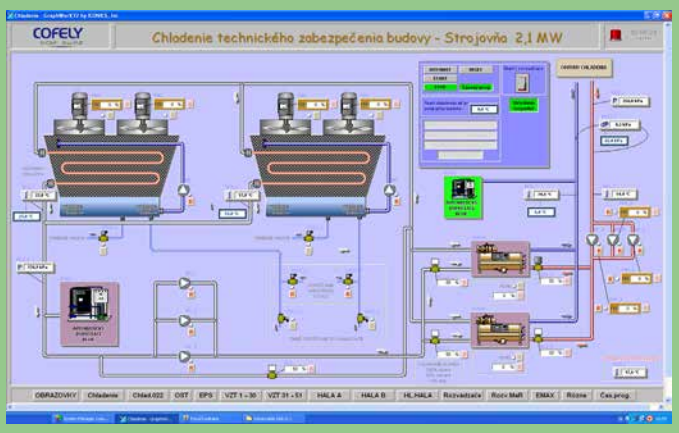
The communication between the central computer and the multimedia components is based on the local Ethernet network using diverse protocols including SNMP, C-BUS/LON, DMX, HTTP and ASCII.

Conclusion

ICONICS and ECCOS inženjering help bring ancient history to life. A balance of technologies powers the exceptional interactive experience of the Museum of Krapina Neanderthals.

Ondrej Nepela
Bratislava, Slovakia

Outside of Ondrej Nepela Stadium



Ondrej Nepela Ice RInk Monitoring Display

About Ondrej Nepela Stadium Ice Rink

The Ondrej Nepela Stadium ice rink in Bratislava, Slovakia, near the edge of the Carpathian mountain range, held the International Ice Hockey Federation (IIHF) Ice Hockey World Championship in 2011 and is one of the world's most modern ice hockey facilities. Nicknamed the "Orange Arena" for its brightly colored staircases,the Ondrej Nepela Stadium is the oldest hockey arena in Slovakia, with a history that stretches back to the 19th century. Located in Slovakia's capital city, the ice rink lies near the famous Danube River and makes for a scenic and historical locale.

ICONICS Software Deployed

The newly retrofitted arena now has a main rink with two training areas and a 9,766 person capacity. The old Building Management System, installed by SAUTER for Ondrej Nepela, was unable to keep up with the needs of the ice rink. To make necessary improvements, Ondrej Nepela, with the help of systems integrator Cofely, implemented ICONICS GENESIS32™ HMI/SCADA and AlarmWorX™32 Multimedia software to monitor and control the following:

- Air handling system (HVAC) including fan coils, VAV boxes and a heat exchange station
- Rink cooling technology
- Emax Management System
- Skylights

Project Summary

Using ICONICS software, Ondrej Nepela had an increase in manageability as well as in energy efficiency. With nearly 4,000 data points interfaced, Ondrej Nepela can monitor every facet of the ice rink in real time, knowing that all data and alarms are being recorded historically so that trends can be viewed and analyzed. Using ICONICS ScheduleWorX™32, over a hundred defined schedules are executed. With this introduction came a new vision for the ice rink, as it now includes Fault Detection, Alarming and Central Controlling. Fault Detection Diagnostics (FDD) has revolutionized how the ice rink operates. Instead of waiting for something to break or become a serious threat or problem, now the operators are alerted to all potential threats and can remedy them before they become a

debilitating issue. With AlarmWorX32, the ice rink has access to visualization of all points associated with an alarm. It tracks histories and includes the essential alarm trending for better understanding of fault causes.

Benefits of the System

Ondrej Nepela is particularly pleased with ICONICS software's excellent graphics, tools for automatic data processing, ease of engineering through the use of aliases and the open connectivity. They are also very glad that ICONICS software features modularity, as this allows them many options moving forward. Thanks to the newly implemented ICONICS system, the Ondrej Nepela project is easier to monitor and control. Energy efficiency and plant manageability have both increased and the stadium looks to have an even longer history ahead of it.

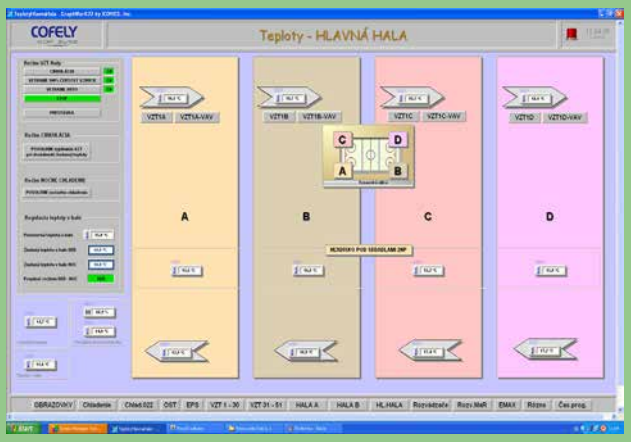
Conclusion

With the ICONICS HMI/SCADA Building Management software system including GENESIS32 and AlarmWorX32 Multimedia, the "Orange Arena" operators have seen great improvements in manageability, operability and overall efficiency and new benefits are realized every day. The home rink for HC Slovan Bratislava can now continue setting ice hockey records knowing that the rink is safe, secure and in good hands.

Characteristics of the System

The Ondrej Nepela Stadium Ice Rink Project is comprised of several different aspects:

- 130 DDC Controllers connected to the BMS computer
- 3,897 Data Points
- 1,039 Monitored Alarms
- 342 Trends and Historical Records
- 134 Defined Schedules through ScheduleWorX32



GENESIS32 Display for Ondrej Nepela

Ondrej Nepela Ice Rink Alarm Monitoring

Exceptional Features of GENESIS32

- Excellent Graphics
- Tools for Automatic Data-processing
- Use Aliases
- Modularity
- Open Connectivity

The Pentagon
Washington, D.C.

Aerial View of The Pentagon
Washington, D.C.

The Pentagon Building Operations Command Center

> *"(On 9/11/01…) What was the value of this system the day it did not shut down? From my laptop, I tapped into the Pentagon's automation network and sent out commands that closed dampers and turned off fans around the building to contain the smoke."*
>
> **Steve Carter**
> Facilities Engineer
> The Pentagon

About The Pentagon

The Pentagon is the headquarters for the United States of America's Department of Defense operations. It houses more than 23,000 employees, both military and civilian, all contributing to the planning and execution of the defense of the United States.

ICONICS Software Deployed

The Pentagon/Department of Defense selected ICONICS GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite featuring the AlarmWorX™32 Alarm Management System.
An OEM version of GENESIS32 provides the building control systems for the new renovation project of the Pentagon in Washington, D.C.

Key Features

With over 6.5 million square feet under one roof, the Pentagon is the world's largest office building complex. It has three times the floor space of the Empire State Building in New York City. The United States Capitol building would fit into any one of the Pentagon's five wedge-shaped sections.
Included in the building controls are systems for:

- HVAC
- Fire
- Security
- Lighting
- IT/Telco Critical Monitoring
- Water Systems
- Hazardous Agent Monitoring

Coming up with a design to monitor and access all of these systems was no easy task. The US Government wanted a main screen from which any one of the systems, on any floor, in any one of the five wedges, and

from any one of the Pentagon's five rings, could be accessed in three operator actions or less.

Project Summary

O&M Engineering, Inc. and its talented team of experts worked closely with the customer to develop a clever use of cascading pop-up menus (with submenus for each of the systems) placed over an enhanced aerial graphic of the building. Navigating to a given system within the building reveals rich and functionally accurate 3-D representations of the controls system information complete with animations.

Conclusion

Started in 1997, the scope of this project is so large that the renovation of the building controls systems will span more than a decade. One challenge for this application is backward compatibility over the course of the multi-year project, and ICONICS is ready to deliver. There probably is not a more extensive, more secure, more sophisticated building control system in the world.

An Overview Screen with Drilldown Menus

A Building Operations Control Screen

The amount of information is staggering, and will potentially exceed a half-million points. A team monitors these systems around the clock in the Pentagon's Building Operations Command Center (BOCC). In addition to the individual workstations for each operator, five 90-inch displays provide wall-to-wall monitoring. Should an event happen, an operator can direct any workstation display to any one of the monitors for collaborative analysis.

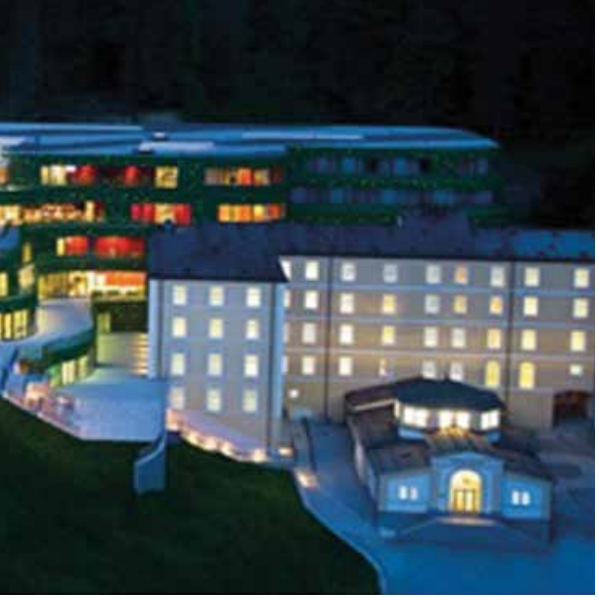
Based on the visualization requirements, ICONICS was uniquely suited to deliver with its award-winning visualization engine included in its GENESIS32 Automation Software Suite. GENESIS32 comes with an extensive set of symbols for designing rich, informative graphics displays.

ICONICS is proud to participate in such an application with the requirement to access thousands of parameters, from thousands of screens and all at a moments notice.

Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

AlarmWorX
Multimedia OPC Alarm Management Software



Rimske Terme
Rimske Toplice, Slovenia

RIMSKE TERME®
MDCCCXLVII
BUSINESS WELLNESS SPA RESORT

Rimske Terme Resort
Rimske Toplice, Slovenia

An Overview Screen of Rimske Terme Resort's BMS

About Rimske Terme

Rimske Terme is a luxurious Business, Wellness and Spa Resort, located in the town of Rimske Toplice, Slovenia ("Rimske Toplice" being Slovenian for "Roman Spa"). The location's thermal pools have attracted visitors for centuries, with evidence of visits during the Roman Empire. The Rimske Terme resort is comprised of several buildings including Hotel Sofijin Dvor ("Sofia's Palace", with 43 rooms and a restaurant), Hotel Rimski Dvor ("Roman Palace", with 68 double rooms/suites, pools and a health center with professional medical supervision) and Hotel Zdraviliški Dvor ("Spa Palace" with 75 double rooms/suites and an additional health center). The resort, which also contains a conference center, is mostly known for its spa facilities based around the area's historic, healing thermal baths.

In 2010, the resort started on a project to update their Building Management System (BMS).

ICONICS Software Deployed

Rimske Terme, working with system integrator, Robotina d.o.o., selected ICONICS GENESIS64™ HMI/SCADA software for their new Building Management System integration project.

Project Summary

As part of its planned BMS installation, Rimske Terme wanted to integrate a number of existing automated systems, including hotel room temperature regulation, room emergency/security functions, air conditioning, lighting, and diesel fuel use. They also wanted central control over their heating/cooling (heat pump) station, pumping station, thermal water pump station and electric power station operations.

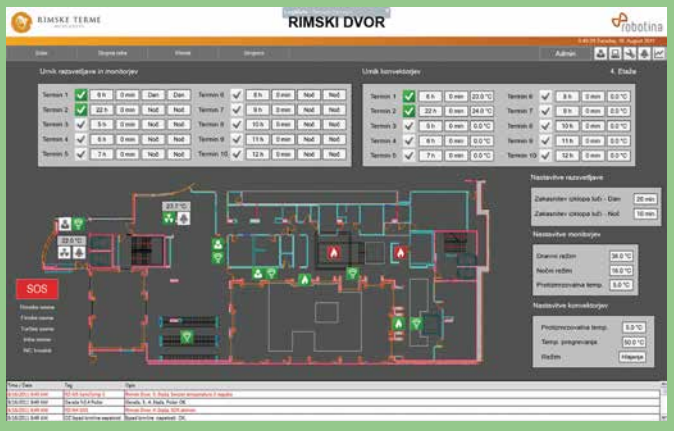
Systems Integrated:

- Hotel Room Temperature Integration
- HVAC Systems
- Security Systems
- Lighting Systems
- Thermal Water Pump Station
- Fuel Storage
- Electric Power Stations

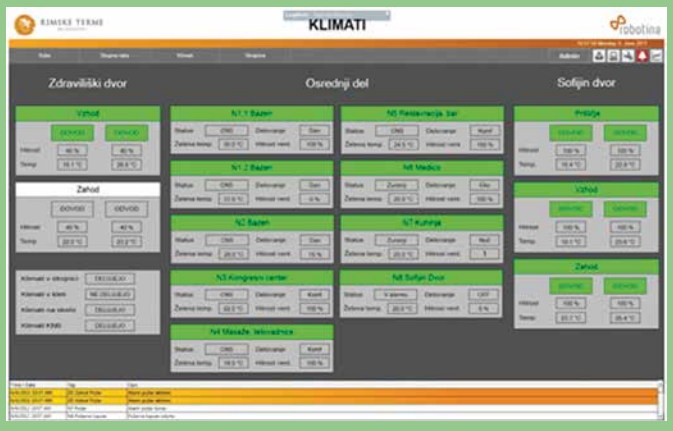
The hotel room automation required a BMS that could adapt to a few differences in each location. For instance, the heating/cooling in Hotel Sofijin Dvor and Hotel Zdraviliški Dvor is based on air diffusers, while in Hotel Rimski Dvor, it is accomplished via fan coils.

These changes are easily taken into account as the BMS is able to help set desired parameters and then monitor and regulate them. In addition, each room's security/alarm (SOS) functions are also handled via the BMS.

The parameters for all heating/cooling systems and subsystems are set through the BMS. The BMS provides continually updated statuses for each system, allowing the system administrator to adjust parameters for optimal regulation. For instance, with the air conditioning system, the BMS can automatically switch each HVAC control on or off and between operating modes (Economy, Comfort, etc.), following prepared operating schedules.



Lighting and Fan Scheduling per Floor of the Resort



Oversight of Air Conditioners

Each HVAC control module also includes a panel that allows users to set temperatures locally.

Rimske Terme has connected GENESIS64 to programmable controllers through an OPC Server. Systems and subsystems are mutually connected or integrated. For example, presence sensors provide information for heat/cooling modes and for switching lights. The complete system consists of more than 200 programmable controllers with CAN bus-connected expansion I/O modules. The controllers communicate between themselves and with the monitoring system over an Ethernet network.

Benefits of the System

As part of the BMS implementation, Rimske Terme wanted to ensure energy efficiency within its hotel rooms. Each room includes a card holder/sensor which can detect the presence of a hotel guest and can then automatically start heating or cooling the room, as needed. In addition, each room contains sensors for detecting open windows, which are connected to the automated system and which can stop heat or cooling, further reducing unnecessary energy consumption.

As a whole, conditions are set to fit the needs of the resort's demanding guests. This means that,despite providing desired temperature regimes, the BMS also uses adaptive scheduling, integrated with multiple functions,to provide optimal, energy efficient performance.

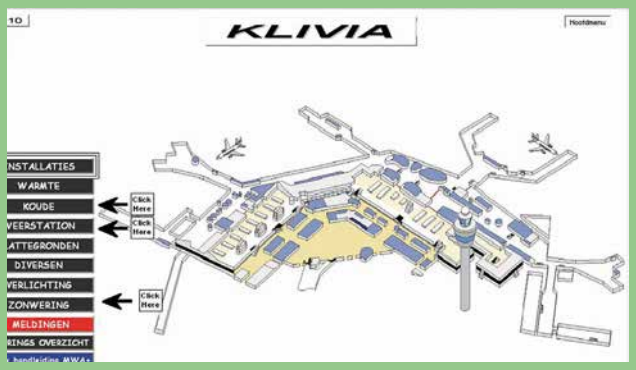
Since installing GENESIS64, Rimske Terme has remarked about its "simplicity of use" and the benefits of allowing for remote control. As a result, the resort has expanded its management stations, including one in hotel reception and another mobile station for maintenance purposes, all connected for remote operation and password-protected for secure access.

Conclusion

GENESIS64 provides Rimske Terme and Robotina d.o.o. with a building management software solution as stress-free as the resort's therapeutic facilities. The resort staff can relax a bit now too, thanks to ICONICS.

Approaching the Tower
Amsterdam Airport Schiphol

Schiphol Airport
Amsterdam, The Netherlands



Main Menu Screen at Schiphol Airport

> *"The Alias functionality within the product saved us a lot of time in building displays. This enabled us to reuse the same display for another floor."*
>
> **Guy van Lingen**
> Project Engineer
> JCI Netherlands

About Amsterdam Airport Schiphol

Amsterdam Airport Schiphol is the national airport of The Netherlands. It's the 10th biggest airport in the world based on total number of passengers (about 47 million) and 14th based on the number of tons of cargo shipped. The airport is built as one large terminal split into three large departure halls, with further expansion planned.

ICONICS Software Deployed

Amsterdam Airport Schiphol selected an OEM version of GENESIS32™ including GraphWorX™32 and AlarmWorX™32 for this project. This suite of software tools now runs on over 30 PCs for the application of monitoring over 300,000 tags.

Key Features

The project was implemented by JCI Netherlands utilizing M5, an OEM version of GENESIS32. It runs on three Microsoft Windows terminal servers and allows the 30 operators to work on the system at the same time.

Included in the building controls are systems for:

- HVAC
- Fire
- Security
- Lighting
- Telephone
- Water Systems

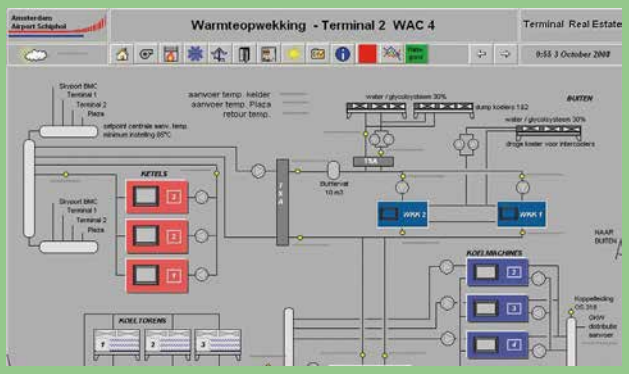
The complete project consists of 10,000 GraphWorX images. The system is equipped to handle over one million alarms and events per month.

Benefits of the System

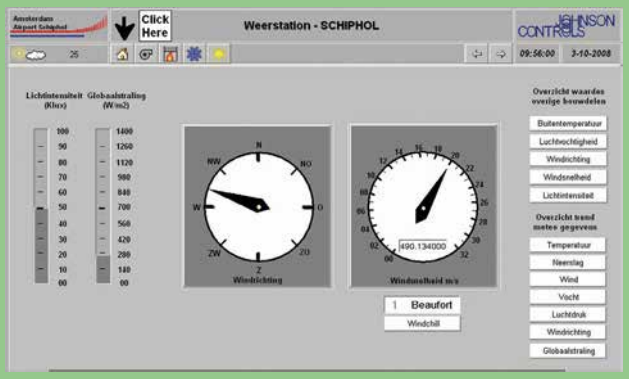
The provided solution is based on an open system, making it easier to develop bigger projects in the future. Also, it's now easy to retrieve data out of the systems without writing converters. One of the biggest advantages for the customer is easy expansion of the system to other platforms including Web browsers such as Internet Explorer (via WebHMI™) and mobile operating systems.

Conclusion

The Schiphol Project is certainly impressive. With 30 screens, 300,000 tags, three servers and 30 operator stations, it's one of the biggest Building Automation systems on the planet. The system has now been running for three years without any major complications.



A Cooling Control Screen



Weather Monitoring Control Screen

Case Study Details

Facts and figures about this ICONICS Solution and Schiphol Airport:

- Over 47 million passengers a year
- Over 1.5 million tons of cargo a year
- 300,000 tags
- 30 Screens
- 30 Operators
- 10,000 GraphWorX images

Solutions Highlighted

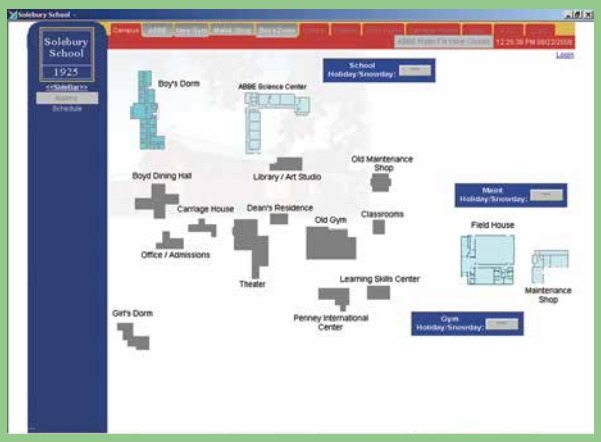
GraphWorX
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

WebHMI
Web Based Real-time Automation Software

Solebury School
New Hope, Pennsylvania

On Campus at Solebury School
New Hope, Pennsylvania



Main Campus Map via HMI/SCADA Application

"We have used ICONICS software products almost exclusively on our installations since 1991. Their consistent high performance and value are always major factors in the success of our projects. The versatility and fully customizable nature of the software allowed us to adapt perfectly to the varied technical issues we encountered on the Solebury campus and to precisely tailor the HMI to fit the needs of their personnel."

Walter L. Horigan
President
Vortechs Automation, Inc.

About Solebury School

Solebury School is a coed, college preparatory, boarding and day school, for 220 students in grades 7-12. Founded in 1925, Solebury's beautiful 90-acre campus is located on Phillips Mill Road, two and one half miles north of New Hope, in the heart of historic Bucks County, PA, mid-way between New York City and Philadelphia. The school prides itself on its small size, the individual attention given to students and the deep mutual respect between faculty and students. A rigorous academic program with honors and AP courses, an ESL program for International students, a Learning Skills program, and a full range of arts, athletics and activities are further distinctions of the school.

The school sought an automation solution for energy management as well as for centralized control, operation and maintenance of various systems including HVAC. Solebury School approached Vortechs Automation of Huntingdon Valley, PA for the project.

ICONICS Software Deployed

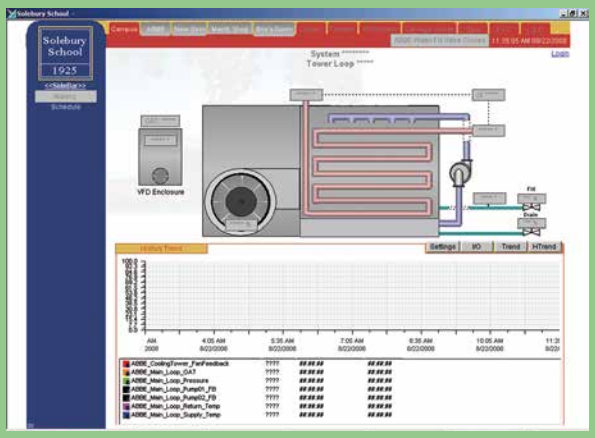
Solebury School selected ICONICS industrial automation software solutions based upon Vortechs Automation's recommendation. Among the products utilized are ICONICS' GENESIS32™ V9.1 Web-enabled OPC-integrated HMI/SCADA suite, AlarmWorX™32 Multimedia (MMX) distributed enterprise-wide alarm notification system, and ScheduleWorX™32 calendar-based scheduling tool.

Project Summary

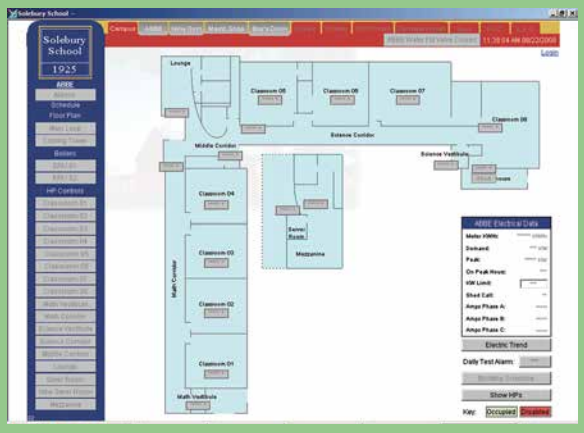
After a survey of the campus, the engineers at Vortechs Automation were sure they could help Solebury School save on energy costs through the automation of its existing heating and cooling systems. Specifically targeted were the school's science and math building, gymnasium, boy's dormitory and maintenance facility. The new Direct Digital Control (DDC) system now consists of approximately 50 KMC controllers linked together in several RS-485 sub-LAN groups, all connected to the campus Ethernet network. GENESIS32 V9.1 was selected for the industrial automation software suite's HMI function.

lighting controls and water detection on the floor of the server room.

Scheduling is an important requirement for Solebury School. It's directly related to anticipated cost savings and helps meet the school's aim to be a "good environmental citizen". As soon as ScheduleWorX32 was introduced by ICONICS, the school and Vortechs Automation knew it would be a great fit for their project. Solebury School's equation for comfort, convenience, control and cost-savings is proven with Vortechs Automation and ICONICS.



Cooling Tower Monitoring/Control



Floor Plan for the Abbe Science Center

Benefits of the System

The ICONICS software and KMC OPC Server reside on a PC located in the campus' main server room. Remote HMI is available to campus users through two browser nodes, located in the business office and in the maintenance office. Real-time data is logged to Microsoft Access. Historical data can be presented in graphical form on an equipment-specific basis. TrendWorX™32 reports, part of GENESIS32's functionality, are defined for total electrical energy consumption. Alarms are broadcast to the appropriate operators using email or text messaging. The system also includes a number of customized items including a sewer line backup detector in the main gym, occupancy sensing tied into

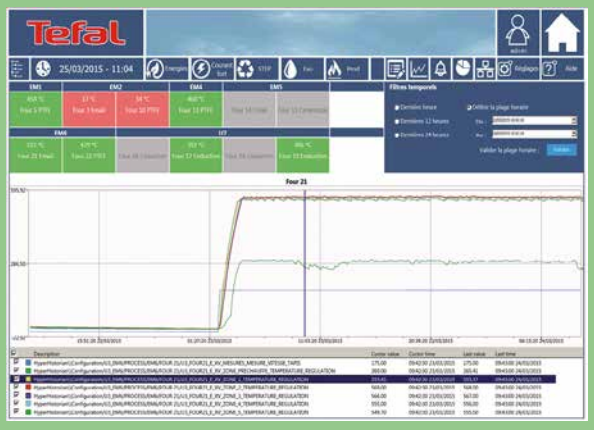
Case Study Details

ICONICS' solution for Solebury school includes:

- Full Point and Click Control
- Centralized Scheduling allows school year to be programmed in advance
- Energy Management - using prioritized load shedding activated by real time utility meter data
- Pre-emptive Alarming and Central Control
- Integration with existing Microsoft Windows XP and Windows Server 2003 installations throughout the campus

Tefal SAS Headquarters in Rumilly, France

Tefal SAS
Rumilly, France



Energy Trending Screen at Tefal Using Historical Data Via ICONICS Hyper Historian

> *"This transition helps us towards energy efficiency. Digital tools allow us to connect objects, such as gas or electricity meters, in order to follow, in real time, our consumption and to alert company personnel at all levels. ICONICS is a Microsoft partner and this relationship has allowed us to install a solution for our energy management that is sustainable and scalable. This energy metering project, and in particular the installation of ICONICS software, has allowed us to create energy key performance indicators, that are published at each level of the company with needed information."*
>
> **Cédric Delavallade**
> Energy Manager
> Tefal SAS

About Tefal SAS

Tefal SAS, headquartered in Rumilly, France is a subsidiary of Groupe SEB, a "world leader in Small Household Equipment". Groupe SEB, which estimates it sells six products across the globe per second (adding up to 200 million products sold every year throughout 150 countries), has approximately 25,000 employees spread through 29 manufacturing sites worldwide. Tefal's Rumilly location employs approximately 1,850 people within 160,000 square feet of building space, with an additional 160 employees in Tournus, France within 21,000 square feet.

ICONICS Software Deployed

Working directly with ICONICS France, Tefal SAS selected: ICONICS GENESIS64™ HMI/SCADA suite; Hyper Historian™ high-speed, robust data historian; AnalytiX® suite of analytical tools (including the Energy AnalytiX advanced energy management software); WebHMI™ Web-based, real-time automation software; ReportWorX™ enterprise reporting, charting and analysis software; and BridgeWorX™ real-time workflow for data bridging.

Project Summary

Every year, Tefal manufactures around 44 million products in what was a high energy-consuming process. The manufacturing process entails many

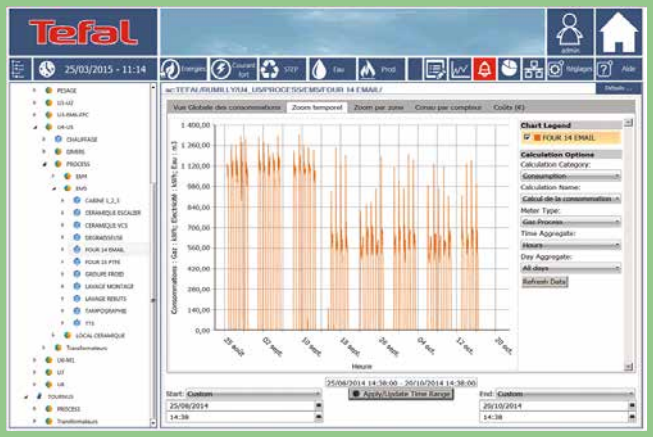
phases, including cooking, drying and cooling. The energy costs for manufacturing operations could hit as high as eight million euros, split between four million for electricity costs and four million for gas. Considering these numbers, top management at Tefal decided to launch an Energy Efficiency project to reduce manufacturing-related energy costs.

Tefal began the project by making an energy diagnosis, in order to learn real-time consumption levels towards the goal of making improvements leading to energy-related savings. The company had several initial objectives at the launch of their Energy Efficiency project. They wanted a map of their energy (electricity, gas and water) consumption in order to prioritize actions for the higher consuming machines, to use for future comparison of past consumption and to validate the expected financial gains compared with initial estimates. Tefal required the establishment of Energy KPIs to be published to key team members (including the site director, technical director, management controller, manufacturing manager, facility manager and multiple operators) to notify them of energy-related gains. The company also wanted a clear indication of energy/electricity availability in order to prepare for new manufacturing projects, optimize energy contracts and be able to meet French energy regulations.

Tefal sought an energy management system that could be implemented without revising their existing architecture. They aimed to connect the new system to equipment already in place, using standard communication protocols such as OPC, for use of real-time data in addition to archiving and recovery. The planned solution needed to interface with multiple pieces of equipment including Allen-Bradley, Eaton Moeller and Schneider Electric PLCs (via OPC), a Socomec power device (also via OPC) and a Producim MES system (via SQL query in an Oracle database). It also needed to be easy to use, to provide access via Web clients without installation, and to manage different needs including monitoring, reporting, commanding, GEO SCADA/mapping, alarm management and trend management. Tefal's selected solution would also need to integrate with existing Microsoft components (SQL Server, Excel, etc.), manage consumption of electricity, gas and water (including a way to easily add meters), and provide energy cost management capabilities.

A competing solution was considered, but was rejected due to it being difficult to use (not ergonomic or intuitive), missing the ability to add reports or modify parameters without being an expert, too much reliance on scripting and an inability to switch languages.

Tefal Manufacturing/Metered Data Dashboard Made in GENESIS64



A Process Performance Chart at Tefal

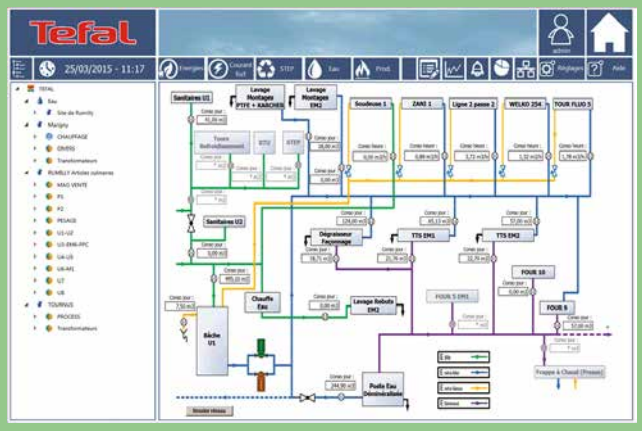
Benefits of the System

Tefal ultimately decided upon installing ICONICS software solutions, which now handles data from multiple meters and transformers, as well as energy

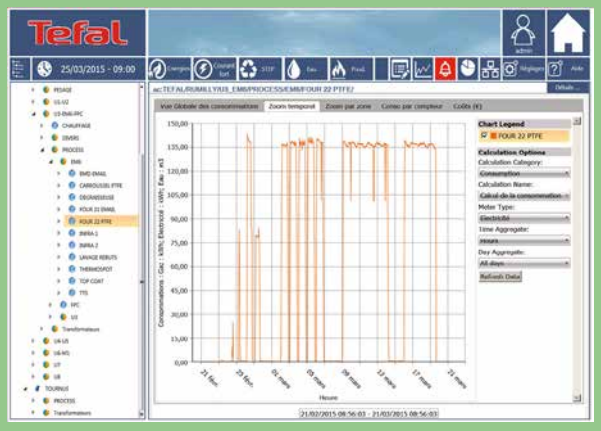
data coming from the PLCs. Additionally, the system handles manufacturing data from the MES system (for instance, the number of pieces manufactured) to calculate energy consumption per manufactured piece. The energy data from the existing building automation software helps to calculate Degree Days (representing the difference between the average daily temperature for a location and a baseline value (usually around 18º C or 65º F). The data from 245 energy meters, 14 energy-related PLCs, 24 power-related devices and nine manufacturing-related PLCs can be visualized in real-time dashboards via Web clients or stored via data historian.

Conclusion

Tefal SAS selected ICONICS software solutions due to ease of deployment and minimal impact on their existing systems. The company was pleased with the scalability of ICONICS software, as well as with its unified, standardized communication with equipment (meters, compressors, etc.) via OPC technology. Groupe SEB, Tefal's parent company, plans to deploy this solution in their nine sites in France and eventually to their 20 additional sites worldwide.



Asset Monitoring at TEFAL Utilizing ICONICS HMI/SCADA



Overall Consumption View of Plant.

With its new ICONICS energy management solution, Tefal was now able to automatically accumulate energy consumption by equipment, area and site. The company could now customize dashboards to provide the best information to each different user type (facility/energy/top management/operator). They could also now connect energy consumption to production and calculate costs (such as energy per piece) and control manufacturing efficiency. Tefal appreciated the built-in quality control, identifying problems with products and having the ability to compare real-time temperatures with expected trends. In addition, Tefal benefits from trend management (including data drill-down) and the ease of use of reports through Excel. Even better, the company has seen a quick return on investment by avoiding equipment energy overconsumption, which has also helped in avoiding overuse penalties by the French government.

Solutions Highlighted

Energy AnalytiX

Energy AnalytiX delivers the back-end calculations, KPI analytics, data historian, reporting and rich visualization that organizations require in order to take decisive action in the management/reduction of utility costs and carbon footprints.

- Quick Deployment to Help Achieve ROI
- Cost Savings through Informed Decisions
- Cost, Consumption and Carbon Reports
- Drill down into Causes of Abnormal Energy Use

BUILDING AUTOMATION
SOFTWARE SOLUTIONS

Integrate existing building automation systems with a single Web-based user interface. Imagine using a fully-integrated facility automation software solution to monitor systems from all major vendors on any device with Any Glass, Anytime™. ICONICS provides a unified management system for visualization, alarm notification, historical data, supervisory control and management information systems.

Productive facilities in today's environment demand economical operations and management. Effective facilities management means your organization can focus on its core business and on increasing the bottom line by reducing operational costs.

ICONICS has been certified by the BACnet Testing Laboratory (BTL) with the highest level of BACnet compliance, the B-AWS profile.

Windows 10 Compatible

Windows 8 Compatible

Windows Server 2012 Certified

BACnet TESTING LABORATORIES BTL

ICONICS

Make the Invisible Visible™

Town of Arlington / Peirce School
Arlington, Massachusetts

Town of Arlington

Town of Arlington
State Seal

The Peirce School's Main Control Screen, Generated Via GENESIS64™

About Town of Arlington / Peirce School

The Peirce School, a public elementary school located in the town of Arlington, MA, teaches approximately 280 students from the nearby Peirce district, from other Arlington districts (through open enrollment) and from Boston (through the Metropolitan Council for Education Opportunities [METCO] program). The school is named after Captain Solomon Peirce, who served in the Revolutionary War. The original school building was built in 1924 and demolished in 2001. The current school facilities were built in 2003.

ICONICS Software Deployed

The Town of Arlington, working with Microsoft, selected ICONICS GENESIS64™ HMI/SCADA suite, in addition to the AnalytiX® suite of analytical tools, including Facility AnalytiX predictive software for facilities management.

Project Summary

Arlington Public Schools sought to consolidate its summer-school operations into one building at The Peirce School. Anticipating the need for an increase in air conditioning, the district immediately purchased a new chiller for the school building. The Regional Energy Manager for the town of Arlington (and also of nearby Bedford, MA), Ruthy Bennett, is responsible for looking for ways to reduce energy costs, a high priority for a town named a Green Community by the State of Massachusetts in 2010. The town and school district, both operating on tight budgets, wished to ensure that their decisions to consolidate summer school classes to one location and to purchase a new chiller made financial sense. With the goal towards lower energy and operational costs, Bennett sought energy management software that would be more beneficial than what she considered "glorified schedulers". While researching solutions, she learned of ICONICS' Facility AnalytiX being used to help cut energy costs at Microsoft's headquarters in Redmond, WA. After taking a look at competitors' offerings, Bennett, the town and the school district decided on ICONICS.

Based on advanced Facility Detection and Diagnosis (FDD) technology, Facility AnalytiX uses customizable fault rules to weigh the probability of equipment failure and alerts staff to actions they can take when faults occur. When equipment fails, the software analyzes current and historical information (along with symptom/cause relationships), executes probability algorithms, and provides a list of possible causes sorted by probability.

To save on project costs, the town/school district/Bennett opted to utilize Facility AnalytiX' ability to integrate

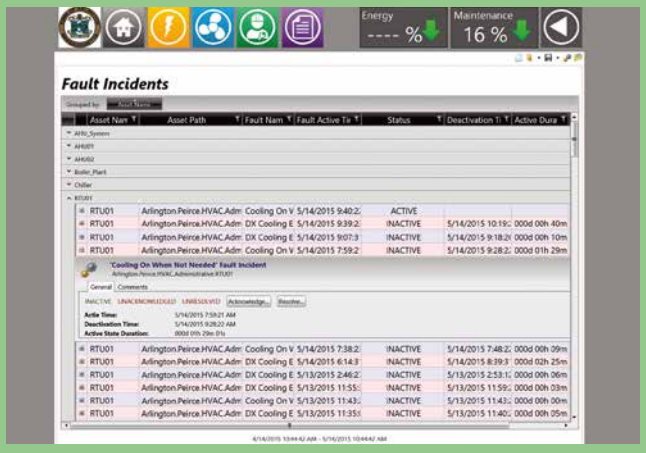
with Microsoft's Azure cloud computing platform. With no additional hardware required, installation was quick. ICONICS engineers connected equipment with control boxes that communicate with the cloud. Using Facility AnalytiX with Azure also allows the school district to access and store millions of data points across a wider range of time, rather than their previous 72-hour restriction.

Benefits of the System

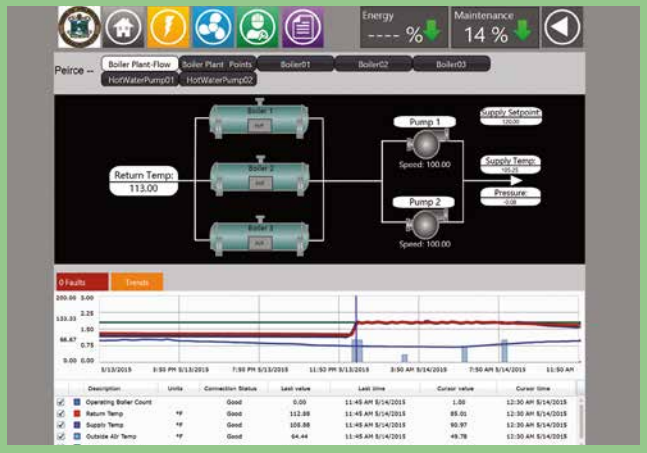
The installation of ICONICS software, especially Facility AnalytiX, immediately paid off during the summer session and continued to do so into the cold New England winter. In the summer, Facility AnalytiX was used to determine that the new chiller was cooling the building to within half a degree of perfection. Although there were no complaints by the occupants, this meant the system was not running at peak efficiency. The software showed excessive on/off cycling by the chiller about every five minutes. Using past bills for comparison wasn't an option since the chiller was newly installed. Facility AnalytiX showed that the chiller was overcycling. The right repairs were then made, saving not only on energy costs but also on the chiller's total lifespan – since constant cycling would put more wear on the equipment.

"ICONICS technology was the most user-friendly," said Bennett, "providing a dashboard with all the information on one screen. I wouldn't have to call a third party, who would then write a report each month—and in the time it took to get the report, I could miss seeing a problem for a month."

Using ICONICS software; Facility AnalytiX, in particular; has helped the school district cut 15 to 20 percent of the time that third-party HVAC contractors spend searching for causes to malfunctions. Natural gas consumption was reduced by roughly 20 percent at the school over its first winter with the new software compared to the previous year, according to Bennett. With such constant commissioning, the town and school district are able to see how repairs or schedule changes effect thermal comfort and energy consumption instantly, without waiting for user complaints or the next month's utility bill. The actions and results are stored via the software and this data can be used at any time within its extended trending capability. The town and school district are hopeful that the results of implementing Facility AnalytiX and Azure can spur behavioral changes that can be quantified and applied to other locations within the town



A Maintenance Alarm Screen Created Through ICONICS Facility AnalytiX

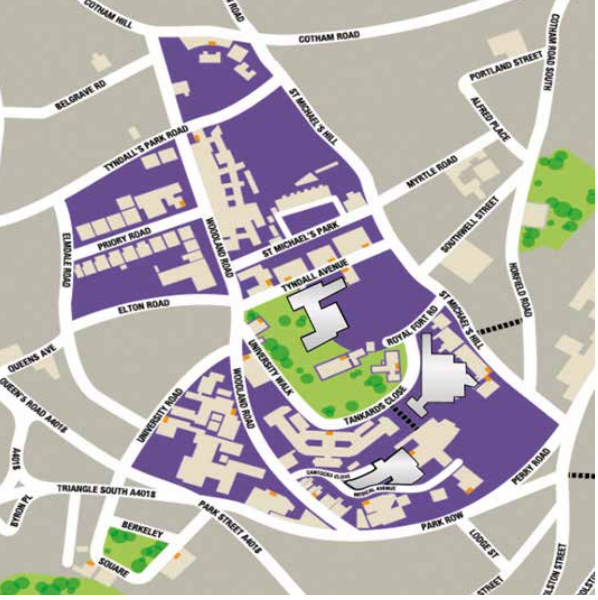


Boiler Plant Monitoring Dashboard Created in GENESIS64

Conclusion

The Town of Arlington and its school board were pleased enough with the implementation of ICONICS Facility AnalytiX at Peirce School that they're looking into applying it in another Arlington school. Bennett is seeking funding to roll out the solution throughout the district and town and then possibly within other Massachusetts cities and towns. For software that literally made summer school "cool", there seem to be no limits.

University of Bristol
Bristol, United Kingdom



University of Bristol Campus
Bristol, UK

An AHU Zone Monitoring Display

About University of Bristol

The University of Bristol (UoB) is one of the top ranking universities in the United Kingdom with 25 academic schools arranged across 6 different facilities. The University owns over 600 hectares of land in and around Bristol and makes use of over 370 buildings. The buildings range in age from the late 17th century to the 21st century. With such a large number of buildings, estate management is very important and a major requirement of the project was to integrate the buildings together to provide a secure, future proof centralized building management solution. For this task the UoB turned to Cougar Automation Ltd. and ICONICS' GENESIS64™.

ICONICS Software Deployed

The UoB was looking for a modern, future proof solution platform that would allow them to continue to build new capabilities as new equipment and buildings were needed and connected to the Secure Data network (SDN). With this in mind, they selected Cougar Automation Ltd., a Microsoft Certified Partner and winner of numerous customer experience awards, who in conjunction with ICONICS, provided a GENESIS64 based visualization solution. Together with a calendar scheduler to integrate and manage the Trend IQ2 and IQ3 BACnet controllers across the facilities, they received a single consistent head-end visualization for all BMS functions, allowing the University to reduce training and maintenance costs, another key driver of the SDN project.

Project Summary

The University of Bristol needed a company with reliable software solutions that could meet the following objectives:

- Provide all departments of the University with accommodations of quality and functionality
- Ensure the most efficient use of all built space and deliver a plan to maximize future development
- Work to reduce the University's carbon emissions
- Enable Building Management System (BMS), Fire Monitoring, Critical Alarms, Sustainability Monitoring, etc.
- Physically secure the network for the Estates Dept.

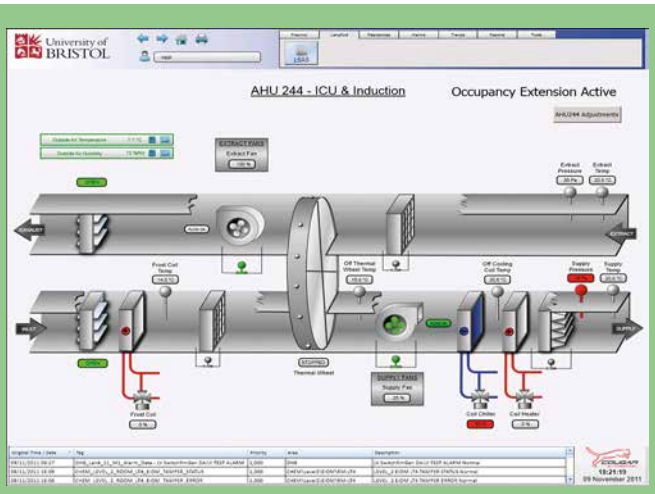
To help achieve these objectives, especially regarding carbon emission reductions, the Estates team required access to information across the entire University campus. To that end, the University

of Bristol commissioned the Secure Data Network (SDN) project.

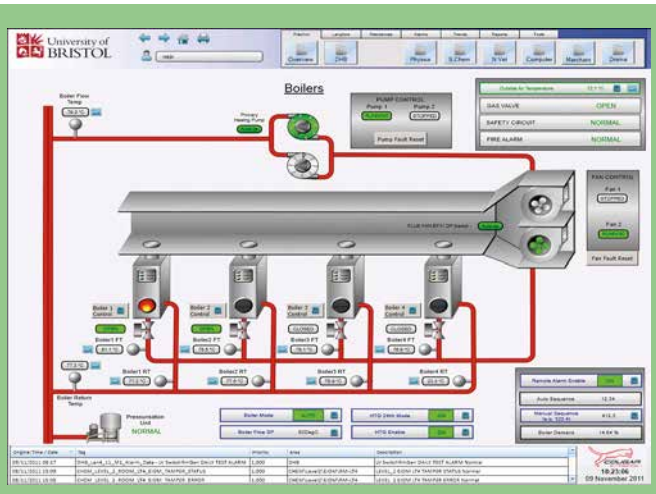
Benefits of the System

With ICONICS' products, Cougar Automation Ltd. was able to provide a solution that met the following SDN requirements:

- Connected to a wide range of devices
- Centralized Alarm Management
- Accessible from anywhere, worldwide
- User friendly
- Scalable and future-proof



An Expanded View of an Air Handler Unit



A Boiler Control Screen

Due to the nature of the deployment, a collaborative approach to the project was undertaken by ICONICS application support engineers and Cougar Automation Ltd. They discovered that by leveraging the open GENESIS64 infrastructure using OPC technology, SNMP, Web Services, BACnet and OLEDB, and utilizing the 64-bit web-based architecture, Cougar Automation Ltd. could create a modern and consistent user interface that could be accessed from a Web browser anywhere within the UoB network and allow the Estates Office to control and manage the facilities. One of the key benefits of using GENESIS64 for the Cougar project engineers was the capability to perform remote Web-based configuration through Workbench64. By enabling remote configuration, project engineers from other Cougar offices were able to collaborate and work on the project together with the Bristol-based engineers concurrently, on the same server. This reduced the overall project engineering costs and enabled the work to be completed much faster.

The comprehensive alarms management capabilities in GENESIS64 also allowed critical BMS alarms to be routed to the Estates Security Office during non-working hours, by raising and lowering their priorities automatically, ensuring that critical facilities are continuously monitored 24 hours a day. In addition to the standard SCADA capability that GENESIS64 was able to provide, the Cougar project team also utilized ICONICS BizViz™ integration capabilities with great success.

Conclusion

The end result was exactly what the University of Bristol was looking for, as a Project Officer explains, "The ICONICS platform is very intuitive and user friendly and we are very happy with the product. It is more than capable of doing everything that we initially want it to do regarding the BMS and critical alarms communications, alarm handling, data storage and archive data handling. We will be extending it to incorporate security systems in the future and further extending it to incorporate as much as we possibly can because the system can handle it all."

University of Pennsylvania
Philadelphia, Pennsylvania

Students gathered on Penn's Philadelphia campus

Penn's Operational Control Center (OCC) running ICONICS GENESIS64™

Aerial view of the University of Pennsylvania in Philadelphia, PA

About University of Pennsylvania

The University of Pennsylvania (Penn), a private Ivy League university located in Philadelphia, PA, was founded in 1740 by Benjamin Franklin. As of Fall 2016, the college is attended by nearly 25,000 students and has a total regular workforce of over 17,500 faculty and staff. Penn's West Philadelphia campus comprises 299 acres with 215 buildings (excluding the Hospital of the University of Pennsylvania).

ICONICS Software Deployed

Penn selected ICONICS' GENESIS64™ HMI/SCADA suite.

Project Summary

The University of Pennsylvania sought to create a unified HMI/SCADA system for 120 buildings, equaling nearly 14 million square feet, throughout its Philadelphia, PA campus. The university wanted the means to manage connected systems via its centralized Operations Control Center (OCC) in order to gain complete visibility into building automation equipment and facility operations. The new system would replace an existing one that the operators found to be obsolete.

The selected HMI/SCADA solution would be required to monitor and control critical equipment across multiple campus buildings including those

related to HVAC systems, chiller plants, electrical substations, lighting and space conditions. In addition, the university required system-level redundancy in order to maximize the uptime of these building systems. Also, whichever vendor was chosen would need to work with third-party contractors responsible for implementing each phase of deployment and work through the replacement of the entire campus command and control system while all the buildings involved remained occupied and in use.

Benefits of the System

Penn's goals for their campus-wide HMI/SCADA solution were to streamline operations, increase energy efficiency and sustainability, and enhance tenant experience, all with an eye towards financial optimization. The university was able to gain real-time visibility into multiple buildings throughout its main campus. The highly-scalable platform allowed for rapid deployment which accelerated implementation throughout each phase of the project. The centralized monitoring and control throughout the campus provides Penn with extremely efficient and coordinated operations.

A Campus Building Mechanical System Monitored by GENESIS64™

Penn's Krishna P. Singh Center for Nanotechnology

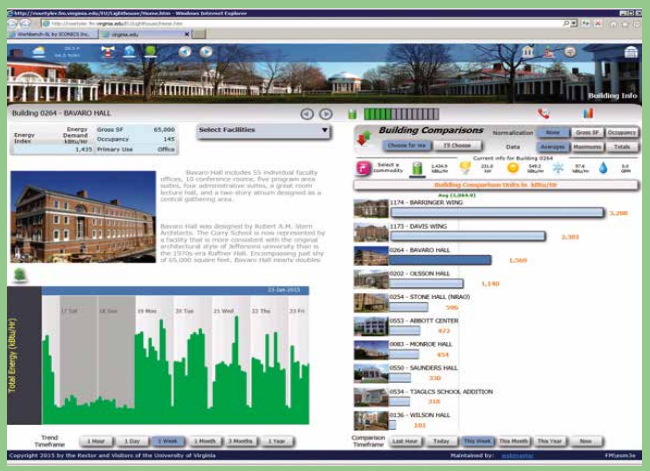
Ultimately, Penn settled on ICONICS GENESIS64. The installed solution now provides an expert alarm system that provides messaging capabilities whenever building equipment is not performing within its operating conditions. With the new solution in place, the OCC can then adjust systems accordingly. GENESIS64 also provided the university with built-in redundancy to ensure maximum uptime. Operators are now able to quickly and efficiently identify equipment that needs attention. This helps to save time and labor costs by addressing certain types of faults remotely using a centralized command and control dashboard.

Conclusion

The University of Pennsylvania was able to meet its unified HMI/SCADA project goals with ICONICS, as well as achieve an additional benefit regarding its critical laboratory facilities. With the added continuous monitoring abilities, the integrity and reliability of various research studies and experiments has been ensured; a definite need for a nationally-ranked research university with an over $900 million research budget.

University of Virginia
Charlottesville, Virginia

An Aerial View of the University of Virginia Campus



The University of Virginia's Lighthouse System, Built via ICONICS GENESIS64

About University of Virginia

Founded in 1819 by Thomas Jefferson, the University of Virginia is made up of 11 schools in Charlottesville, VA, plus the College at Wise, spread out in over 500 buildings or facilities within 1,606 acres. The University offers bachelor's, master's, educational specialist, first-professional degrees (law and medicine), and doctoral degrees in a growing variety fields. The University of Virginia was named as the No. 2 best public university in the 2014 edition of the U.S. News and World Report rankings. In the 14 years since U.S. News began ranking public universities as a separate category, the University of Virginia has ranked either No. 1 or No. 2 and it continues to rank in the Top 25 among the best of all national universities, public and private.

ICONICS Software Deployed

As part of a competitive RFP process, the University of Virginia selected ICONICS GENESIS64™ Building Automation suite, Hyper Historian™ high-speed, robust data historian; MobileHMI™ mobile enterprise application; AnalytiX® suite of analytical tools (including Facility AnalytiX predictive software for facilities management); WebHMI™ Web-based, real-time automation software; AlarmWorX64™ Multimedia for multimedia OPC alarm management; Alarm Analytics alarm management, reporting and analysis software; and BridgeWorX™ real-time workflow for data bridging.

Project Summary

The school required a campus-wide visualization and monitoring platform and wished to implement the project themselves, integrating any newly acquired software with their own "home-grown" systems. The new system, named "Lighthouse", would need to tie into their own generated Big Data; a wide array of locations and equipment, including a main heating plant and two satellite plants, seven chilled water loops (in 13 plants), three primary electric substations, and over 2,800 meters (internal, external and virtual).

The University had several requirements for its new control system. It needed to support trending, reporting and billing functions. It needed to be modern and provide engaging, rich visualization. It needed to provide central alarm management and process scheduling, as well as provide a common interface for building automation system (BAS) integration for utility/facility operators, faculty and staff.

It was important to the University of Virginia that their selected solution be able to connect to a wide variety of data sources, including BACnet, Modbus, OPC, Web Services, SNMP and various other da-

tabases. Equally important was the ability to work with Microsoft's platform, including integration with Windows Server, Internet Information Services (IIS), SQL Server and Active Directory. Other considerations were if the solution could utilize cloud-based servers in addition to those on premises and what are the redundancy options.

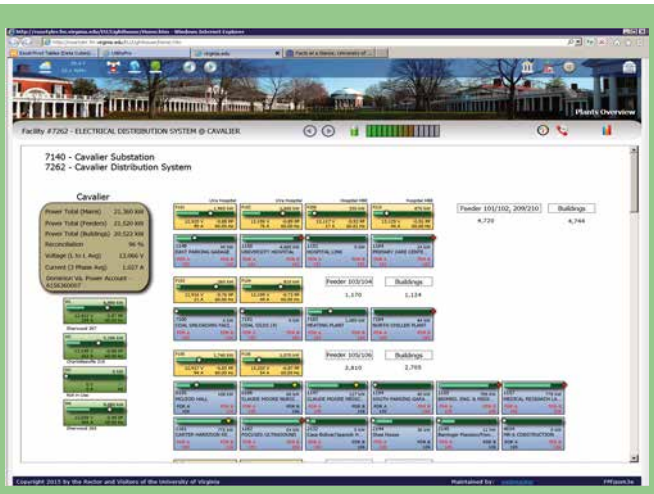
Benefits of the System

The University appreciated the ICONICS platform's asset-based navigation in dealing with energy-related equipment and meters and their existing BACnet architecture. ICONICS Hyper Historian trends over 40,000 of the University's BAS/SCADA/asset point definitions. Each of these points contain dozens of available properties, in addition to alarms, totalizations, averages and other functions. There are over 100,000 different trend views available in the system, comprised of almost six billion data samples per year (based on default sample rate). Hourly summary data exists for multiple plants, buildings and meters, adding up to additional tens of millions of records per year.

The innovative asset-based approach now allows project engineers to easily test their own planned asset structure and definitions. University staff initially focused on setting meter definitions to eventually include in their planned building/plant energy dashboards. The iterative, collaborative process allowed the staff to quickly try multiple "looks" before deciding upon a final visualization theme. Utilizing ICONICS solutions, users are able to see graphic trends of utilities/energy use for timespans from an hour to a year. They can also see instantaneous demand (usage) for all trended utilities for a building along with a comparison with data from other similar buildings along with an average among comparable buildings. Users can choose their own buildings for comparison or use defaults, as well as see average, maximum or total data (either raw or normalized) by gross square footage, to use one example.

After installation, the University of Virginia was able to correct billing errors related to a variety of meter and building automation system issues, using ICONICS Hyper Historian data and visualizations to help highlight anomalies. The ICONICS system revealed symptomatic energy use patterns, which can now be targeted and corrected. With the information provided through the University's new building energy monitoring and control system, the school reconciled into the hundreds of thousands of dollars of energy spending.

A District Energy Summary in University of Virginia's Lighthouse System



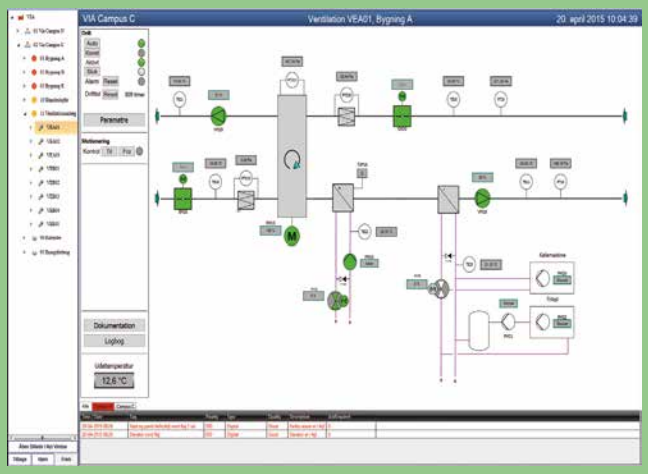
Substation Real-time Reconciliation Screen

Conclusion

Now that the University of Virginia has been able to justify its return on investment in ICONICS software, it plans to expand the system. Future plans include central alarm announcements and alerts for "critical" points, forecasting, and customized pages for specific research or clinical interests. The University of Virginia's Lighthouse project, with ICONICS building automation and energy management software, has become a beacon for future building operations and energy use.

VIA University
Aarhus, Denmark

Aerial view of VIA University



Ventilation Control Screen for VIA University's Aarhus C Campus

About VIA University

VIA University was established in Denmark in 2008, originally spread across 38 sites throughout the country. Today, the university has been consolidated within 18 sites in eight cities. The school provides a variety of educational disciplines, including Business, Design, Movies/Animation, Education, Social Sciences, Healthcare and Technology.

ICONICS Software Deployed

Working with system integrator/design consultant, Balslev Automation A/S, VIA University selected ICONICS GENESIS64™ HMI/SCADA suite, along with AlarmWorX™64 Multimedia OPC alarm management software.

Project Summary

Over the past seven years, VIA University recognized their growth within Denmark, even as it sought to consolidate its campuses from 38 sites to 18. Today, the school's 18 sites are spread across 238,000 square meters, with a population of 25,000 people, including students, teachers, technical personnel and more (14 percent of which are international). As part of this simultaneous regrouping and expansion, the university began construction of new facilities, such as its Aarhus N campus, while considering new options for building management solutions.

VIA University required a software vendor who could provide a cost-effective, open building management solution for their Aarhus N (37,000 square meter) and Aarhus C (47,000 square meter) campuses. Of primary concern was the monitoring and control of campus buildings' daily operation, especially the comfort of occupants, as the university believes that an assured optimized indoor climate for students is the best environment for learning. Minimizing operational cost was also a factor in the school's decision.

VIA University has developed its own building management user's manual, revised once or twice a year, which is considered essential to optimal operations. With this in mind, the school sought a software vendor that would reduce complexity in operations, while ultimately reducing associated costs.

With Balslev Automation A/S's assistance, VIA University chose ICONICS for their software vendor. The school has many years' experience with other long established vendors in Denmark, but found them too costly for this project.

Benefits of the System

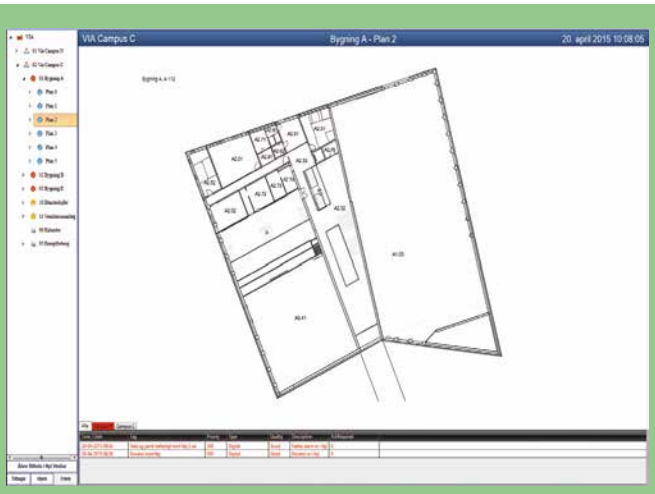
Ultimately, ICONICS was selected for being more cost-effective and for its open system based on open standards. ICONICS GENESIS64 now connects to the university's WAGO PLCs using OPC communications. The software provides interfaces with alarm system, fire detection, access control, UPS and cooling systems, easily handling the school's approximate 15,000 tags.

VIA University has noted its annual operational savings in comparison to before installing ICONICS software.

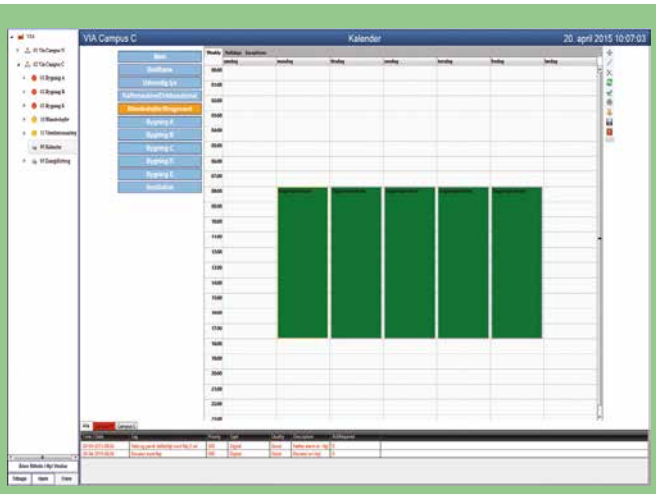
Solutions Highlighted

GENESIS64™
HMI/SCADA and Building Automation Suite

AlarmWorX™64 Multimedia
Multimedia OPC Alarm Management Software



VIA University's Aarhus N Campus Plan in GENESIS64



Scheduling Feature in GENESIS64 for VIA University Building Management

"We have lowered the cost of operation by selecting GENESIS64 and PLC-based controllers for BMS," said Anders Thorsen, Technical Manager at VIA University. "We wanted open systems based on open standards; to have the freedom to select suppliers of our choice in the future. This is saving us money every year."

Conclusion

Pleased with the Aarhus N and Aarhus C rollouts, VIA University is now considering ICONICS for its future expansion efforts. The school is considering integration with solar panels as well as facility management within other locations. Due to its cost-effective, open standards-based solutions, ICONICS is pleased to have been graded so highly by VIA University.

Case Study Details

ICONICS solution for VIA University includes:

- Building Management for Two Campuses (each over 30,000 square feet)
- Reduction of Operational Costs
- Reduction of Complexity Compared to Prior Solution
- Open System Based on Open Standards
- OPC Communications
- Interface with Approximately 15,000 Tags

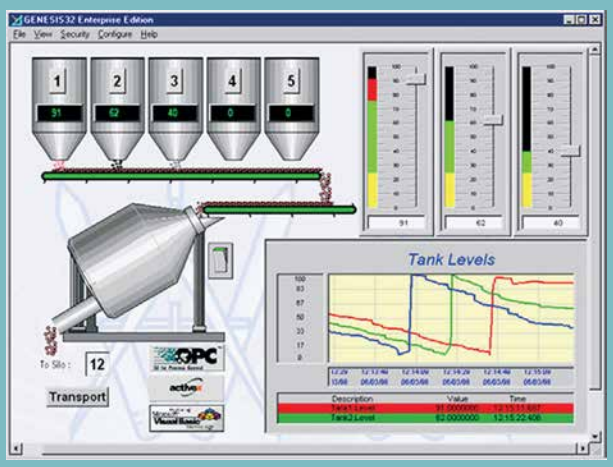
"ICONICS' ability to quickly collect, visualize and report OPC data, and the mix of robust OPC clients were the reasons we based our Enterprise Information System on GENESIS32".

Eric Bellas
Director of Engineering
Cyberlogic

FOOD & PHARMACEUTICAL

Animal Care is a Multi-billion Dollar Industry

Animal Healthcare Co.
United States HQ



GENESIS32 Pharmaceutical Example Screen

About This Animal Healthcare Company

A leading international manufacturer and distributor of animal healthcare products, headquartered in North America, required the installation of industrial automation software. One of the company's plants is involved mainly with pharmaceutical manufacturing and packaging. The company sought an industrial controls solution that would best manage and monitor critical process alarms. The pharmaceutical manufacturer also planned to replace an existing visualization system, seeking a solution that provided additional enhancements.

The animal healthcare company uses ICONICS solutions to interface with Allen Bradley PLCs via Foundation Fieldbus, Data Highway Plus industrial LAN and Ethernet network communication structures. Among the Microsoft solutions used on-site are SQL Server and Excel, which are used in reporting and trending.

ICONICS Software Deployed

The veterinary care/pharmaceutical company utilizes ICONICS' GENESIS32™ OPC Web-enabled HMI and SCADA suite (including AlarmWorX™32, GraphWorX™32 and TrendWorX™32 components) with AlarmWorX™32 Multimedia (MMX), DataWorX™, WebHMI™ and Pocket GENESIS™ add-ons. The company also uses the BizViz™ manufacturing intelligence/business visualization suite (including the BridgeWorX™, ReportWorX™ and MobileHMI™ components).

ICONICS automation software solutions for such pharmaceutical applications provide numerous benefits, including:

- Applications Designed for FDA 21 CFR Part 11
- Operational Accountability through Sequence Checking
- Security with Integrated Popular Biometrics
- Accurate Audit Trail of Operator Actions

Project Summary

When deciding upon their new industrial automation software, engineers at the animal healthcare company's plant considered:

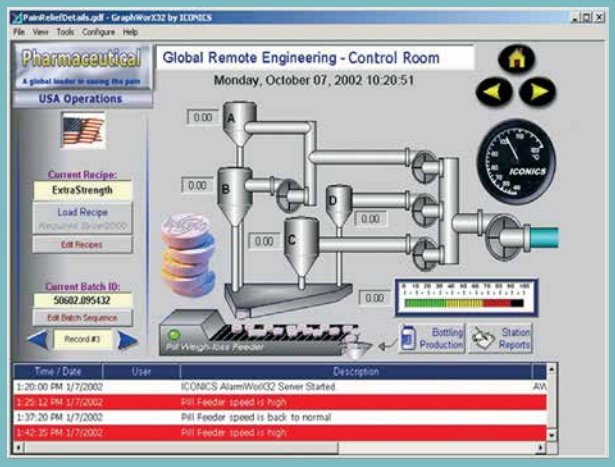
- Alarm Notification via Multimedia (including paging, emailing, phone dialing, etc.) – easily handled through AlarmWorX32 MMX

- Fast Reconciliation to Alarms – achieved through AlarmWorX32 and integration with additional GENESIS32 HMI/SCADA components
- Mobile Connectivity – via Pocket GENESIS and MobileHMI™ utilities, helping to alleviate many on-site, manual processes.

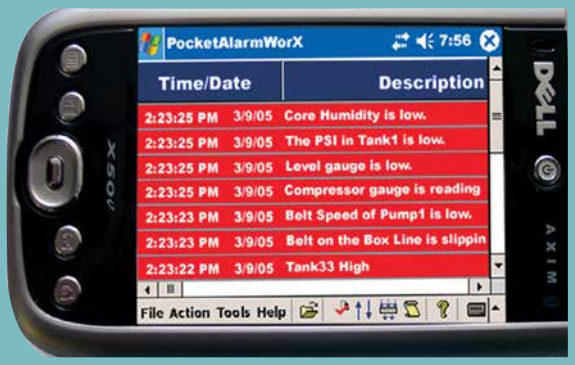
One engineer remarked at how important it is for a company involved with the FDA to ensure that alarms get reconciled right away. With ICONICS, when alarms happen, they're immediately recorded and acted upon.

Conclusion

After a successful first implementation, this customer is now considering ICONICS' Alarm Analytics™ component as well as additional solutions for facility performance analysis, new KPIs and electronic batch records.



GENESIS32 Example for the Pharmaceutical Industry



A Pocket GENESIS (Pocket AlarmWorX) Example

ICONICS' software immediately meshed with standard operating procedures and built-in processes. The alarm-based, report-based and trend-based components complement the organization's Lean Manufacturing efforts.

The company especially noted the cost-effectiveness (due to savings in system development), flexibility (due to the ability to quickly adapt to system changes) and graphics/visualization capabilities of the ICONICS software.

Solutions Highlighted

BizViz
Manufacturing, Intelligence/Business Visualization

GraphWorX
HMI Graphical Display Package

TrendWorX
Logging, Charting and Reporting Software

AlarmWorX
Multimedia OPC Alarm Management Software

CSL Behring and CSL Limited
Marburg, Germany

CSL Behring
Biotherapies for Life™

Vials of CSL's H1N1 Vaccine

A CSL Employee Transporting the H1N1 Vaccine

About CSL Behring and CSL Limited

CSL Behring, a subsidiary of CSL Limited since 2004, traces its corporate roots to Emil von Behring, the first Nobel Prize recipient for Medicine and Physiology in 1901. As a pioneer in the field of immunology, Behring's ground-breaking work resulted in the development of vaccinations against diphtheria and tetanus. CSL Biotherapies, also a subsidiary of CSL, operates some of the world's largest flu vaccine manufacturing facilities for the global market. With more than 80 years of experience in the development and manufacturing of vaccines, and nearly 40 years with flu vaccines, CSL is committed to reliability, safety and quality.

Following the June 2009 World Health Organization announcement of an influenza pandemic, CSL developed a pandemic vaccine (H1N1) and signed a 180 million dollar contract with the US Department of Health and Human Services (HHS) to provide bulk H1N1 influenza antigen. The HHS contract includes the opportunity to use the influenza vaccine dispensing and packaging facilities of CSL Behring in the US and Germany.

ICONICS Software Deployed

ICONICS' GENESIS32 software suite enables rapid and safe production of the H1N1 flu vaccine for the US market in CSL Behring's FDA-approved filing and packaging facility in Marburg, Germany. DataWorX™32, TrendWorX™32, WebHMI™, AlarmWorX™32 and ICONICS OPC DataStore combine to create the solution bridging the gap between industrial automation and the medical field.

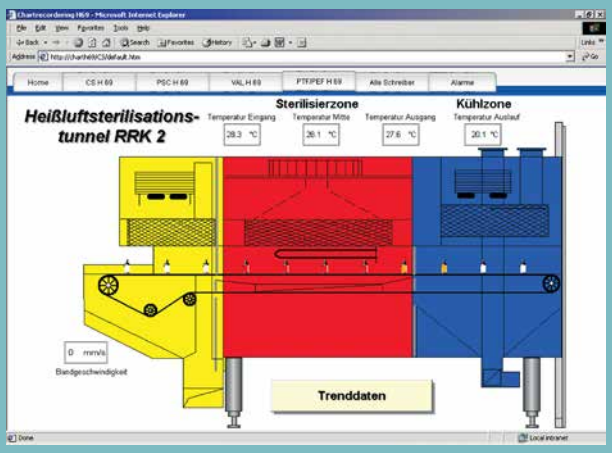
Key Features

Although their packaging facility is located in Germany, CSL Behring must still meet the recording requirements of the FDA. Specifically, CSL Behring must adhere to the 21 CFR Part 11, which outlines the controls necessary for the regulated industry to utilize electronic records and electronic signatures. CSL Behring requires a system where production data can be logged reliably and stored safely.

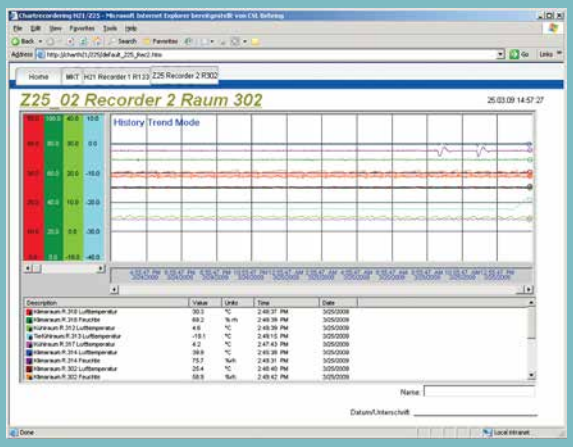
Audits, system validations, audit trails, electronic signatures, and documentation of electronic data are subject to inspection for 42 years following production date. ICONICS' GENESIS32 data and historian applications are designed with these industry-standard regulations in mind.

Summary

For the past 11 years, ICONICS, in collaboration with System Integrator 8F Computer GmbH, has provided CSL Behring with an automation solution for their bottling facility in Germany. The



GraphWorX Representation of a Bottling Line



GENESIS32 Recording Data for CSL Limited

In total there are 23 servers, running Windows Server 2003, SQL Server 2005, the ICONICS software and Kepware OPC servers. The is a total of 109 users who can use the system simultaneously.

H1N1 vaccine is dispensed into single use syringes or multi-dose vials in a sterile conveyor line, and then packaged and sent to CSL's Illinois site for distribution across the US.

TrendWorX32 facilitates enterprise-wide data collection, logging, charting, reporting and analysis. A DataStore OPC Server stores collected information from proximity sensors, such as bottles in and out, rejects, and total production counts. AlarmWorX32 improves CSL's ability to identify, quickly respond to and to document abnormal conditions throughout the bottling process. Internet and Intranet connectivity is provided to GENESIS32 applications securely through WebHMI.

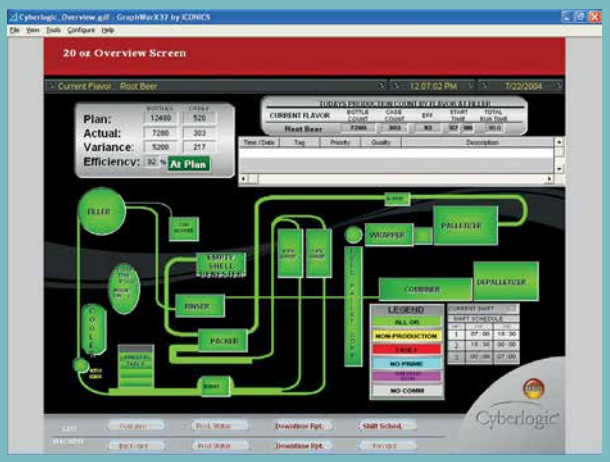
Conclusion

CSL, 8F Computer GmbH and ICONICS have benefitted from a long lasting relationship, and currently play integral roles in a global environment where the H1N1 influenza vaccine is in high demand. Efficient and safe bottling methods are afforded by ICONICS industrial automation solution making for a healthier world.

Cyberlogic
Troy, Michigan

Cyberlogic

Cyberlogic Applications Include Soft Drink Production and Bottling



Bottling Process Monitoring Screen

> *"ICONICS' ability to quickly collect, visualize, and report OPC data, and the mix of robust OPC clients were the reasons we based our Enterprise Information System on GENESIS32".*
>
> **Eric Bellas**
> Director of Engineering
> Cyberlogic

About Cyberlogic

Cyberlogic Technologies, Inc. is a leading independent supplier of industrial communication drivers and servers. Since 1992, the company has introduced many firsts, including the first 32-bit communication drivers for Windows platforms, first virtual drivers to migrate legacy applications to 32-bit operating systems and the first remote drivers to enable access to industrial networks from plant networks. Cyberlogic's New Enterprise Information System for traceability is based on GENESIS32™ visualization software and ReportWorX™ from ICONICS.

ICONICS Software Deployed

Cyberlogic's Enterprise Information System is used to trace all source materials for a finished product and is capable of mating the traceability information onto the outgoing products for use further down the supply chain. The system uses GraphWorX™32, the visualization component for GENESIS32, as the main interface into the system. ReportWorX™ is also used to provide production shift reports, downtime analysis and traceability reports. The Enterprise Information System includes a Web-based visualization interface that is based on WebHMI™.

Key Features

The Enterprise Information System can be used in a wide range of applications. A recent deployment was for a large soft drink bottling company that needed traceability to track the ingredients to the original source. From a code stamped on the outside of the bottle one can quickly trace what batch of syrup was used and where the cap, bottle, and water came from. A report can then be generated that shows where other finished products that contain any of the source ingredients were shipped.

Being able to collect and report this information in real time can save thousands of dollars. In the event a recall is needed, the bottling company only needs to pull individual bottles instead of entire lots.

Project Summary

The Enterprise Information System runs on Microsoft Windows 2000. Data is collected via OPC servers into GENESIS32 for visualization and analysis. The data repository is handled by a Microsoft SQL database that ReportWorX can data mine, GENESIS32, SQL, and the OPC servers. OPC connectivity to the plant floor is provided via Cyberlogic's OPC servers that are dynamically linked to the ICONICS GENESIS32 system.

The Enterprise Information System that was recently deployed for a large soft drink bottling company was monitoring 4 lines with 10 PLCs per line for a total of over 2,500 I/O points. Allen Bradley SLC 500 PLC 2 and ControlLogix PLCs are used and the communication is via one universal, highly optimized, Cyberlogic DHX OPC Server. This OPC server contains all device drivers and no other software is needed to communicate with the Allen Bradley PLCs.

Cyberlogic Bottling Process Screen

Production Status Screen

Some key advantages to using the Cyberlogic OPC Servers in conjunction with OPC Clients from ICONICS include:

- Redundant network with automatic switch-over
- Filtering of Unsolicited Messages
- Load Balancing
- Data Write Protection

Benefits of the System

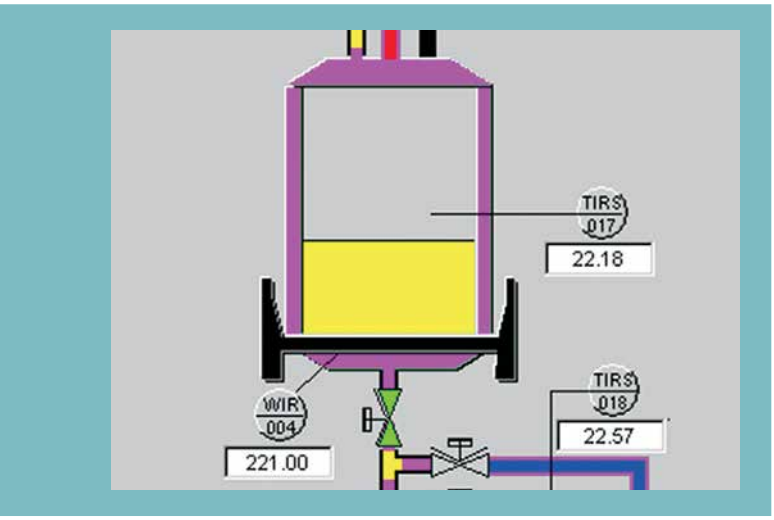
The main benefit for this system is that users can quickly identify products in the event of a recall. Instead of pulling entire shipments, users can quickly identify what lots or even what bottles need to be recalled.

Conclusion

ICONICS and Cyberlogic continue to work together to provide the best Enterprise Information System for traceability. Future projects include new components for the plant's information system that will aid in advanced diagnostic and reporting.

Leciva a.s. Pharmaceutical
Prague, Czech Republic

Leciva a.s. Pharmaceutical Headquarters
Prague, Czech Republic



Storage Tank Display at Leciva a.s.

> *"The ICONICS GENESIS32 software system has significantly increased the completeness of our documentation and level of quality assurance."*
>
> **Milan Turinsky**
> Control Systems Engineer
> Leciva, a.s.

About Leciva a.s.

Leciva, a.s. Pharmaceutical is the largest Czech pharmaceutical company and dominates both the Czech and Slovak markets. Their main business is pharmaceutical production and distribution. The company was founded in 1993 under the Czech Republic National Enterprise. In 1997, the Czech government sold all the remaining shares it held to Leciva, a.s. They sell the majority of their pharmaceutical substances to developed industrial countries in the EU and Eastern Europe (Slovakia, Russia, Poland, Ukraine etc.). Leciva, a.s. dominates the local Czech Republic market with a 65% share of the production of this pharmaceutical substance sector.

ICONICS Software Deployed

Leciva, a.s. has selected ICONICS to provide them with their pharmaceutical production management system after evaluating other vendors' offerings. ICONICS' GENESIS32™ software suite of tools was installed at their production operations in Prague, which include GraphWorX™32, TrendWorX™32 and ScriptWorX™32. The GENESIS32 Software is running on a Siemens Simatic S7 OPC server.

Key Features

Leciva, a.s. Pharmaceutical has high recording requirements to meet with regards to documenting every aspect of their production process to meet GMP (Good Manufacturing Practice) standards in their industry. Leciva, a.s. was the recipient of the first GMP Certificate in the Czech Republic, awarded by the State Institute for Control of Pharmaceuticals (government regulatory agency similar to the FDA in USA) in 1994. Thus, they needed a system which provided extensive security measures, audit trails for

operators, all production data to be logged reliably, operational sequence checking and traceable alarm and event history recordings to be retained. Therefore, Leciva, a.s. selected GENESIS32 software, which met all their process documentation, production data collection and report requirements to meet their GMP standards.

Project Summary

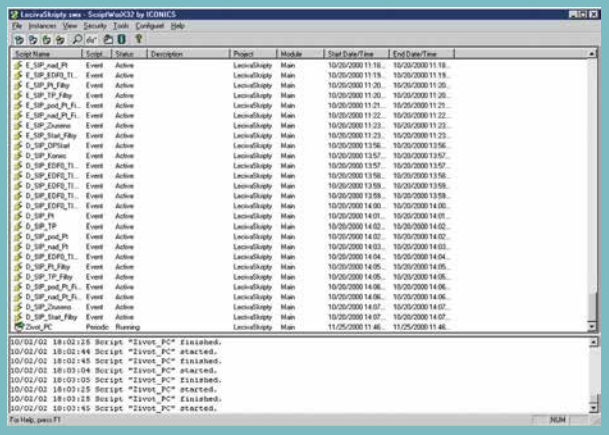
Leciva, a.s. produces formulated solutions that are collected in storage tanks. The production process then draws the solutions from the storage tanks that feed the automated liquid filling machines that fill the final deliverable product ampoules. The monitoring and data collection software system was configured and installed by the systems integration firm, SIDAT CZ.

The GENESIS32 system monitors every aspect of the production operation, provides clear directions and information for each of the operators via GraphWorX32 HMI screens and collects production data which is stored in Microsoft Excel spreadsheets and presented in numerical and graphical formats. The software system interfaces with a Siemens S7-400 PLC, connected to a Simatic and one gauge system. There is one PC node implemented and the system has over 1,000 digital and analog tags.

The GENESIS32 system processes over 100 scripts that can run simultaneously using VBA 6.0 integrated into ScriptWorX32.

Benefits of the System

The ICONICS GENESIS32 software system has increased the quality and completeness of the documentation collected on the production operation processes and has provided clear production information and procedures that are delivered to each of the operators running the equipment. Reports on production operations are generated from the data collected and stored in Leciva's local, workstation -level, databases.



Leciva a.s. Production Data in Excel

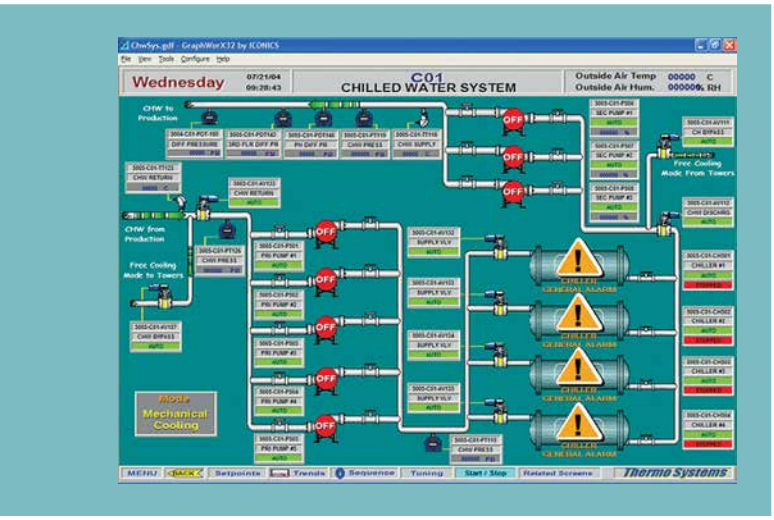
Leciva a.s. Main Production Facilities

Conclusion

ICONICS has worked closely with Leciva, a.s., a Czech Republic pharmaceutical company, to make this production management project successful in every aspect. Leciva, a.s. participates in the ICONICS End-User Support and Maintenance program to keep its software updated and for access to technical support personnel as needed.

Thermo Systems
East Windsor, New Jersey

Thermo Systems Applications Include Validated Pharmaceutical HVAC Systems



A Thermo Systems Water Chiller Screen

"Thermo Systems selected the ICONICS GENESIS32 suite based on its proven track record in mission-critical control system applications, including FDA 21 CFR Part 11 compliance. Our customers are able to more easily expand their control systems due to ICONICS' non-proprietary, flexible, OPC-based solutions."

David Musto
Principal
Thermo Systems

About Thermo Systems

Thermo Systems is a leader in the design and installation of mission critical PLC-based control systems with particular expertise in the automation of validated pharmaceutical HVAC systems, utility systems and validated manufacturing applications. Thermo Systems is based in East Windsor, NJ with a branch office in Duquesne, PA and services customers throughout North America and overseas.

ICONICS Software Deployed

Thermo Systems has implemented ICONICS' GENESIS32™ (GraphWorX™32, TrendWorX™32, and AlarmWorX™32) as the software solution for a variety of control systems applications including the automation of pharmaceutical HVAC, industrial chiller plants, pharmaceutical manufacturing, hospital lab controls and HVAC, as well as biopharmaceutical and aerospace facilities.

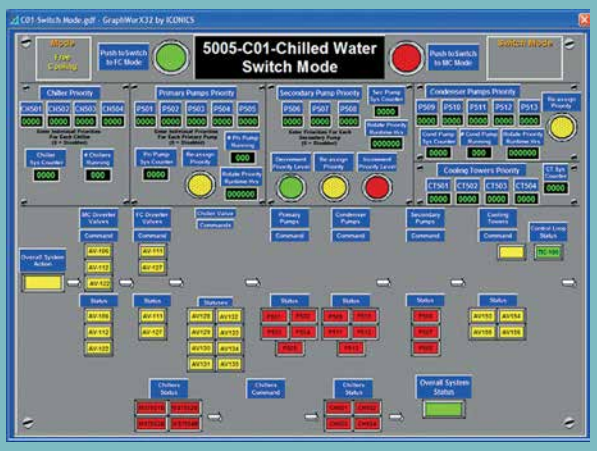
Key Features

- Thermo Systems recommends ICONICS GENESIS32 to customers who require a cost-effective software solution with a wide range of programs and features.
- Thermo Systems engineers and customers value the user-friendliness of GraphWorX32 and the relative ease with which users can add points and develop graphics as well as alias and popup files.
- Thermo Systems deploys ICONICS ReportWorX to provide customers the easy-to-use, full-featured custom data reports.

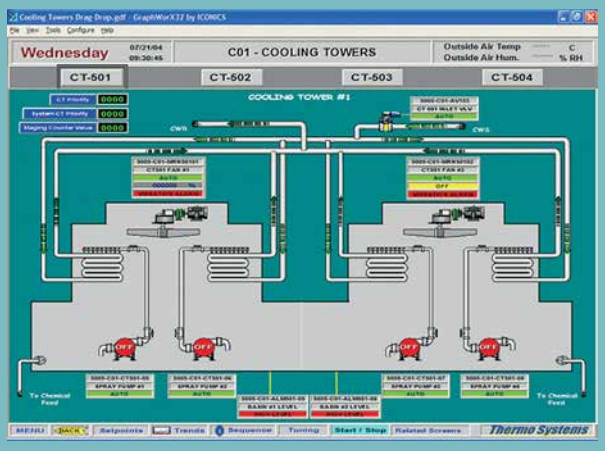
- The ICONICS WebHMI™ solution has been deployed in many applications as a secure way to provide Internet and Intranet connectivity for several Thermo customers.

With over 20 years of controls engineering experience, Thermo Systems has been a leader in the design and installation of mission critical control systems. Thermo Systems utilizes the latest technology from manufacturers such as ICONICS and has a focus on interoperability using the OPC standard. Thermo Systems designs open architecture systems that ensure end user flexibility in expansion.

The controls market has changed over the past few years creating an ever growing demand for open, standardized and reliable software systems. After researching other software tools on the market, Thermo Systems selected ICONICS' GENESIS32. This OPC-based software provides a non-proprietary, graphical front-end solution with unparalleled integration and a proven guaranteed migration path. ICONICS' GENESIS32 has met and exceeded all of Thermo Systems' graphical software requirements.



Switch Control Screen



Cooling Tower Management/Control Screen

Benefits of the System

GENESIS32 makes it easy to create applications that comply with the latest FDA regulations. Audit trails, enforced logins and restricted security access are integrated into every GENESIS32 software system. Customers who are deploying GENESIS32 in an FDA 21 CFR Part 11 application will enjoy these benefits:

- Maximum security with integrated biometrics
- Operational accountability through sequence checking
- Accurate audit trail information of who did what, when, where, and why
- Applications that are designed for the FDA 21 CFR Part 11 regulation

Conclusion

ICONICS works closely with Thermo Systems on projects to assure a successful ICONICS' GENESIS32 deployment. Thermo Systems participates in ICONICS' SupportWorX™ maintenance program to keep their software updated and for access to ICONICS' technical support personnel, as needed.

Sample of the United Biscuits McVitie's Brand

United Biscuits
Glasgow, Scotland

Main Control Screen at UB - McVitie's

> *"The ICONICS GENESIS32 software is so easy to use. DataWorX32 is a very understated component with a great deal of power. The graphics that can easily be created in GraphWorX are outstanding."*
>
> **Senior Management Team**
> UB McVitie's Glasgow Plant

About United Biscuits/McVitie's

Quality is a primary concern for McVitie's, part of United Biscuits (UB). At their plant in Tollcross, Glasgow, they have developed a control technology, which puts them in the front line on this point, as well as reinforcing the approach to innovative solutions encouraged across the business. The question was how to translate the intelligence of more than 30 years experience into an automatic, high-performance process control system, which is user friendly and could be retrofitted on the existing equipment.

ICONICS Software Deployed

The software selected for this application is based on ICONICS GENESIS32™. On the production line, which makes their Rich Tea biscuits, they have a multi-zone oven that produces thousands of biscuits per hour. Before automation was in place, an operator with many years of experience governed the control of this oven, and a great deal of skill and high-quality biscuits were produced. The knowledge of this operator was documented and formulated into a set of rules for adjusting the oven control based on the quality of the biscuits exiting the oven. ICONICS engineers from ICONICS - UK, working alongside McVitie's technical staff, developed a software system to execute the rules and automatically make the control adjustments within the oven.

Key Features

The data acquisition module, DataWorX™32, acquires and manipulates these data, which are then accessed by the HMI, GraphWorX™32, and a rules-based module. The rules-based module built into GENESIS32 then applies the rules developed from more than 30 years experience of the operators and outputs the instructions, via the scripting module

ScriptWorX™32, to the PLC, which controls the burners and temperatures in the oven zones.
GraphWorX32 also performs the other more traditional SCADA functions of graphical display of data and process elements. This includes the screens to select which one of the products is to be manufactured.

Project Details

For each different product there is a different set of rules to apply to the oven control. However, GENESIS32 makes this adjustment automatically for whichever product is selected. It also displays the rules, which are being implemented at any particular time. All rule modifications are password-protected, online through the operator's terminal.

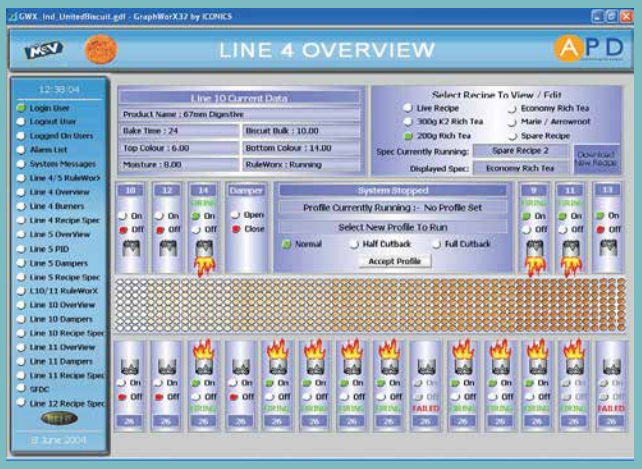
Benefits of the System

By utilizing these methods for control of the baking process. United Biscuits is now able to put into practice new ideas within the process itself to further improve their product and to provide a competitive advantage over their competitors. The actual recipe for the fine control of the oven is top-secret to McVitie's, but now they make a higher-quality biscuit and line efficiency has improved by 2.5%.

Conclusion

United Biscuits is delighted with its success on controlling this line, and it has taken GENESIS32 as their standard HMI/SCADA software, with installations planned throughout the UK and Europe. The software was integrated by APD of Annan, Dumfriesshire UK. APD also provided on-site training for the operators and engineering personnel.

United Biscuits Production Line



Burner Control Screen

Solutions Highlighted

DataWorX
OPC Data Aggregation, Bridging, Redundancy and Tunneling

ScriptWorX32
Creation of Visual Basic for Applications (VBA) 6.0 scripts.

GraphWorX
HMI Graphical Display Package

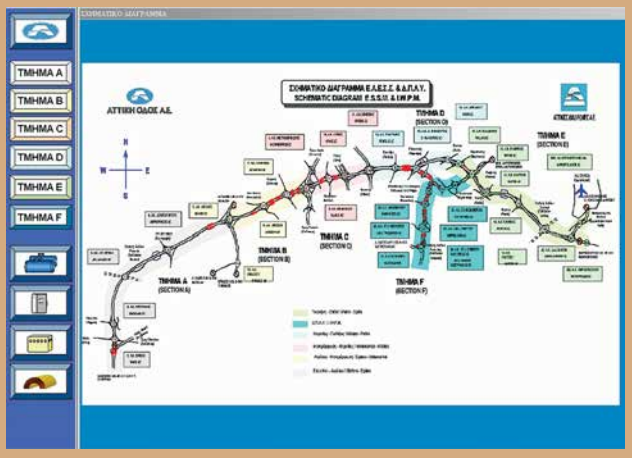
"[Our] ultimate aim of creating a comprehensive data solution to manage all aspects of property asset management has been achieved through working in partnership with ICONICS. Whatever the request 'no' or 'we can't do that' does not appear to be words in their vocabulary; the project team regularly go above and beyond to consistently exceed expectations in tight time frames."

Roger Taylor
Property Director,
BIS

GOVERNMENT INFRASTRUCTURE

Attiki Odos Motorway
Attica, Greece

Aerial View of the Attiki Odos Motorway



Attiki Odos Motorway Overview Screen

"This monitoring and control application was designed and integrated on time by Algosystems SA in Athens, Greece. The SCADA graphics are very impressive, and the system allows our operators a complete picture anywhere on the highway. The system provides a fast and reliable centralized tool for our emergency personnel and support team. The ICONICS software helps make the Attiki Odos a world-class motorway."

Serafim Tsavdaras
Project Manager with AKTOR SA
(part of the Attiki Odos construction team)

About Attiki Odos Motorway

The Attiki Odos Motorway is one of the most modern motorways in Europe. The highest standards have been observed in its design. The motorway extends over 60 km, is four lanes wide, and has 32 multi-level interchanges and hundreds of overpasses. The Attiki Odos uses the most modern equipment for incident detection and emergency response.

ICONICS Software Deployed

GENESIS32™ is used in a redundant configuration along with AlarmWorX™32. The redundant GENESIS32™ servers are responsible for the monitoring and control of all electromechanical equipment for the tunnels and highways. This includes the lighting and tunnel ventilation systems. The air quality within the tunnels is monitored, and GENESIS32 can allow exterior airflow, as needed, to keep the tunnels clear of carbon dioxide, smoke and nitrogen oxide.

Key Features

In addition to controlling the lights and ventilation system for all the tunnels, ICONICS software is also responsible for other systems within the Attiki Odos motorway. All emergency fire hose panels, irrigation pumps, power distribution (medium and high voltage), UPS systems and diesel generators are monitored and controlled by the ICONICS software. MSDE is used for all data logging.

Project Summary

ICONICS' GENESIS32 software system was installed at Attiki Odos to centralize motorway operations and provide the status of all electromechanical systems. The SCADA system enhances the ability of motorway operators to easily identify and handle emergency situations and overcome malfunctions of equipment in order to provide better quality of services.

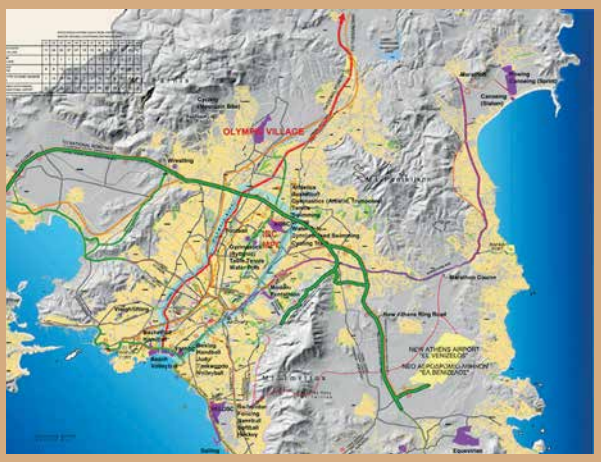
With over 25,000 I/O points, the redundant GENESIS32 servers are interfacing in real time with Opto22 LCM4 redundant controllers and LCSX-Plus controllers over an Ethernet network. The system response time is less than two seconds. GenBroker is used to enhance communication of operator workstations with servers. Algosystems, using ICONICS OPC ToolWorX™, developed a multithreaded OPC server with redundancy features to interface with Opto22 controllers.

Benefits of the System

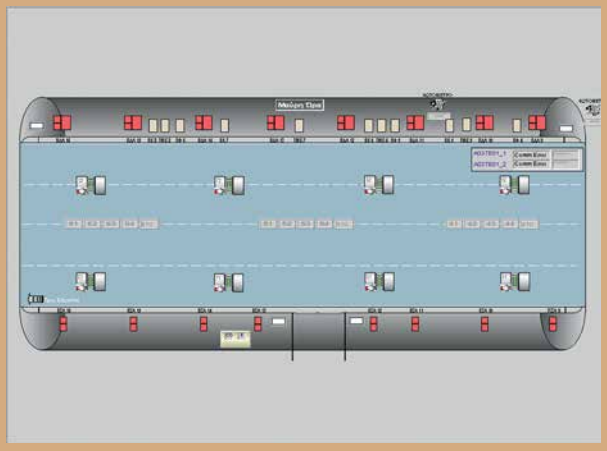
ICONICS software was selected for this application due to the open modular architecture of GENESIS32 along with the proven reliability of the redundant GENESIS32 servers and the breadth of OPC servers and toolsets.

Conclusion

ICONICS, Algosystems Integrators and AKTOR SA have all worked together to make the Attiki Odos, the connector in and around Athens, a successful application. This project was under a tight deadline and opened on time for the 2004 Summer Olympics in Greece.



The Olympic Road Network



A Ventilation Control Screen for the Attiki Odos Motorway in Greece

Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

AlarmWorX32
Multimedia OPC Alarm Management Software

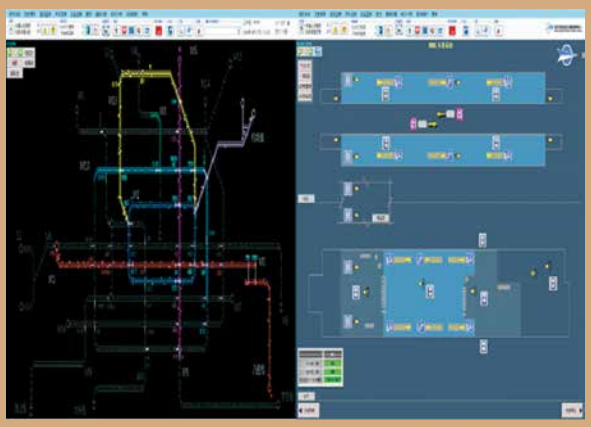
OPC ToolWorX
Rapid OPC Development Toolkit

Beijing Traffic Control Center

Beijing, People's Republic of China

北京

Beijing Traffic Control Center Headquarters



Integrated View of Beijing Rail Line Network

"The ease of use, speed of deployment and project management capabilities of ICONICS' GENESIS32 HMI/SCADA suite resulted in a 30% savings on engineering-related costs. This was a major benefit, and enabled us to meet critical deadlines prior to the 2008 Summer Olympics."

Ng Liang Chin
Project Manager
ST Engineering

About Beijing Traffic Control Center

Beijing, the capital of China and its second largest city, has a population of over 18 million people. The host city for the 2008 Summer Olympics, Beijing is also a major transportation hub, with dozens of railways, roads and motorways within its limits. The Beijing Traffic Control Center (BTCC) was established to monitor a network of Operational Control Centers for the various rail lines operating in the country.

ICONICS Software Deployed

BTCC is using ICONICS GraphWorX™32, part of ICONICS GENESIS32™ HMI/SCADA suite to provide a unified user interface within the monitoring and control center.

A total of 50 operator stations are networked together to help monitor the traffic network.

Project Summary

The project was mainly developed and deployed under the supervision of Singapore Technologies Engineering Ltd. (ST Engineering). ST Engineering is one of the largest listed companies on the Singapore Stock Exchange, with a presence in 35 countries around the world.

The project requirement was to integrate various systems, with emphasis on having a unified user interface linked to real-time information. These systems include SCADA, operator information, CCTV, passenger information, decision support and incident evaluation.

The completed system is linked to receive real-time information from various Operational Control Centers of various rail network lines, while the opera-

tors at BTCC are able to share the rail line data, rail line videos and reports. The completed system provides a link to an Incident Evaluation System that triggers automatic or semi-automatic plans based on certain incidents.

The operators generate various reports by following workflow guidance by the system and forward the reports to the BTCC Database. A Decision Support Database system is also available to the operators, to quickly search and retrieve supporting documents for operational work. A connected CCTV system channels live images from train stations to the Operational Control Centers as well as to BTCC operators. Since the Passenger Information System is also integrated, any emergency information can be quickly relayed to affected line passengers and to other lines for general updates.

Monitor/Control Room within the Beijing Traffic Control Center

Integrated View of Multiple Rail Lines at the BTCC

Key Features

With the hybrid nature of various traffic control and monitoring systems, ST Engineering looked for an application that is flexible enough to provide customization, yet has enough built-in features to start with. GraphWorX32 passed all the tests (stability, flexibility, robustness, longer shelf life) for what the company required. Some of BTCC's systems were running on a non-Microsoft platform. With OPC and XML technology, those applications were seamlessly integrated into GraphWorX32. Powerful automation controls have enabled the system integrator to take their customer's application to the next level.

ST Engineering has also deployed GraphWorX32 at various other projects including Singapore Circular Rail and Kaohsiung Rail in Taiwan.

Conclusion

GraphWorX32 provides an easy way to integrate multiple applications and systems together. With its capacity for large amounts of data, the system can handle a virtually unlimited number of data points within a screen. The native features of GraphWorX32, such as templates, layers, OPC interface, and VBA controls, fully satisfy the integration needs at the programming level. ST Engineering has saved a great deal on costs and man hours, and was able to meet the deadline of completing the project before the 2008 Summer Olympics in Beijing.

One of the Department's Buildings
1 Victoria Street, London

The Department for Business, Innovation & Skills
Swindon, United Kingdom

Department
for Business
Innovation & Skills

Government Buildings, London

Introduction

The Department for Business, Energy & Industrial Strategy (BEIS), formally The Department for Innovation, and Skills (BIS) is the department for business, science, and innovation within the UK Government.

In November 2015, BIS began a journey with ICONICS that was going to allow them to build a scalable, Azure cloud based solution that would revolutionise the way Central Government would manage their property estate. The department invests in skills and education to promote trade, boost innovation and help people to start and grow a business. To this end there are 49 partner organisations that sit under BIS, each with their own estates and facilities related datasets and challenges.

"BIS' ultimate aim of creating a comprehensive data solution to manage all aspects of property asset management has been achieved through working in partnership with ICONICS. Whatever the request 'no' or 'we can't do that' does not appear to be words in their vocabulary; the project team regularly go above and beyond to consistently exceed expectations in tight time frames. At all times ICONICS have been professional, solution orientated and forward thinking. The successfulness of the partnership had already led to further development of the original system solution. ICONICS and the data capture and management solution is central to the future plans of BIS."

Roger Taylor
Property Director
BIS

The Property Asset Management Team was created in April 2014 to manage a portfolio of estate across the partner organisations and BIS. A significant part of this was to ensure evidence based decision making and to optimise the performance of buildings across the office estate. With around 2,500 staff working for the core BIS Department alone, and in excess of 14,500 people working across the partner organisations, there are offices across London,

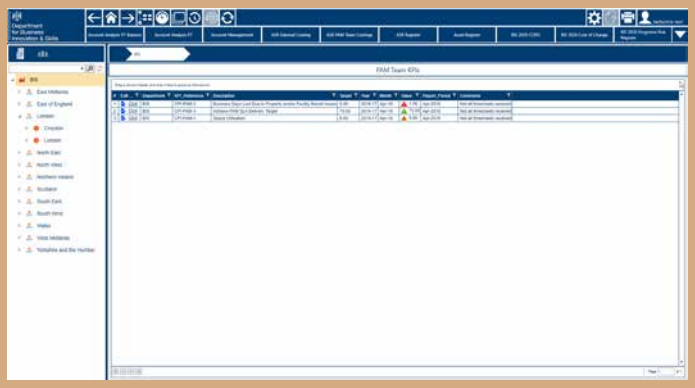
Sheffield, Cardiff, Manchester, Nottingham and a variety of other UK cities.

Therefore, the estates and facilities management challenges that faced BIS were significant; plus the ever-growing need to rationalise and make financial savings meant that sound data management was needed to underpin decision-making.

The Aim

The Department's holistic aim was to rationalise their building portfolio and shrink their carbon footprint by reducing the number of buildings they own and introducing more flexible work hours for their staff. But, in order to have any chance of shrinking their footprint, BIS realised that they needed to be able to analyse the performance of their estate, detect trends and use data to drive proactive estate management. The challenge was that the data and reporting processes for their entire building portfolio was completely fragmented. BIS did make sure to monitor the performance of their buildings. However, their manual data collection processes were so complex that they didn't have the time or resources to digest the data and act accordingly. Imagine compiling hundreds of incongruent spreadsheets for 70 disparate data sources across 180 buildings. It was a data analyst's nightmare. So, BIS established a consistent data strategy and went to market to find a holistic business-wide system; a single "view of truth" to support the management of their properties. They knew they wanted to capture all sorts of operational data; everything from occupancy counts, energy statistics and meter readings to project information, financial reporting and lease agreements; but the Department also had aspirations to one day integrate more real- time/automated building and energy data into the system.

New System: Management Dashboard Screenshot



New System: Property KPI Metrics

The question was, what technology or system could unite, visualise and analyse all of this data and offer the flexibility of a future proof solution.

Implementation

Maxine Oakey, Information Manager for BIS Property Asset Management Directorate, and her team did a lot of market research and whittled down a variety of organisations to a handful of potential software vendors and consultants.

In the autumn of 2015, ICONICS ran a short Azure-hosted proof of concept to demonstrate the capabilities of GENESIS64™ to Central Government. BIS chose three data sources and, within a week, saw that the dashboards that ICONICS had built, combined

"The Data Capture Management system, or DCM as we call it, collates all of our data into one place making analysis, presentation and management of our data much easier, saving us time and resources. We can see all of our data at once instead of depending on multiple spreadsheets, giving the team and our client's one true picture. We can create dynamic graphics giving an at-a-glance representation of our data and modify the system to suit our needs".

Charlotte Tyson
Data Coordinator
BIS

with the flexibility of visualising spreadsheets with different formats, were exactly what they needed. BIS took the 7 BIS partner organisations with the largest proportion of BIS office estate and decided to embark on a journey with ICONICS that, if successful, could potentially be rolled out across the rest of Central Government.

Solution

The Azure-hosted solution provides an integrated view of all BIS building assets. The Property Asset Management Team (PAM), can now drill down to any building, by geographical area, and see over 70 different data types in building dashboard summaries within Azure. There's no longer a need to trawl through hundreds of different spreadsheets to see the buildings occupancy counts, energy consumption statistics, or lease agreements. This is data now accessible within a couple of clicks. BIS can manage all the data entry through a web upload interface, where they can upload their disparate spreadsheets; the solution offers a complete picture across multiple datasets and a single version of the truth.

In utilising Microsoft's Azure Table storage and Event Hub, ICONICS configured a truly scalable cloud solution, meaning that adding data sources in the future, and growing BIS' audience across the government, isn't going to be costly.

Results

The results have been staggering. BIS can now see and prioritise the most underutilised and energy inefficient buildings across the 180 buildings that they're trying to rationalise. BIS estimated that the PAM team used to spend 75 percent of their data collating and validating data.

BIS foresee that this figure will drop to 15 to 20 percent. That's 55 to 60 percent of their resources freed up! The rest of the time will be spent on actually adding value to the data; analysing trends, making and testing hypothesises; truly taking data verified steps to improve underperforming properties.

The ICONICS visualisation and future PowerBI integration is expected to save BIS at least one full-time employee per year. Most importantly, BIS have seen that ICONICS' technology is powerful enough to interface with any other systems or data source when they're ready, ultimately giving Central Government a future-proof platform.

Next Steps

BIS have an ambition to make the ICONICS system an industry standard across the whole Central Government, as well as to add real-time building automation data and push other data into PowerBI. For now though, ICONICS are already making steps to configure a 'browser light version' and a fully mobile responsive HTML5 version, built on ICONICS' commercial off-the-shelf product MobileHMI™.

Make the Invisible Visible

ICONICS

With the most advanced 2D and 3D HMI/SCADA technology, ICONICS introduces its Holographic Machine Interface (HMI), enabling users to make the invisible visible and experience a new dimension in augmented reality for water and wastewater applications.

Learn more at www.iconics.com/HMI17

VISUALIZE | HISTORIZE | MOBILIZE | ANALYZE | CLOUD IoT

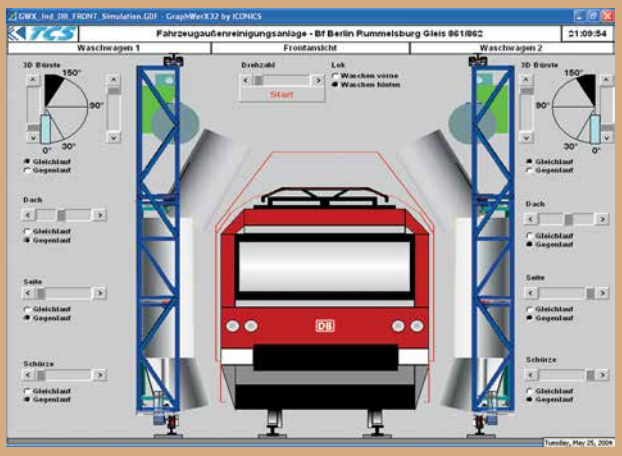
Celebrating 30 Years of Automation Software

Gold Microsoft Partner

www.iconics.com

A Deutsche Bahn Train, Clean and Ready to Go

Deutsche Bahn
Berlin, Germany



A GENESIS32 Washer Screen

"ICONICS was selected for this job for their superior 3D graphics, ease of use and close relationship with Phoenix Contact."

Marco Heyd
CEO
S.A.H. Heyd Group

About Deutsche Bahn

Deutsche Bahn AG railways carry more than 1.8 billion passengers per year throughout Germany and neighboring countries. Deutsche Bahn is also responsible for moving 78 billion tons of freight annually. All service and rail stations are maintained by DB Stations & Services. DN Netz provides the track infrastructure. The company is owned by the German government and is one of Europe's largest transportation providers.

ICONICS Software Deployed

GENESIS32™ Enterprise edition is deployed for the train washing at the most state-of-the-art train washing applications in the world. Alarms are handled by the ICONICS AlarmWorX™32 application. Users can acknowledge alarms from anywhere in the systems. TrendWorX™32 is used for all trending and can give the users up-to-date information, which includes both real-time and historical data. GraphWorX™32, the graphical design and runtime environment for GENESIS32, plays an important role in this application. From GraphWorX32, all monitoring and control for the train washing is handled with rich 3D graphics.

Key Features

The train washing system is revolutionary in the fact that one washing system can accommodate any type and shape of train in the world. A new 3D brush allows for cleaning any shape of train, including the modern bullet train. The GENESIS32 system provides a "learning mode" to allow the system to make the necessary brush and sprayer adjustments. Train specifications are loaded into the GENESIS32 system and operators can use the animation feature in GraphWorX32 to trace the path the train will take through the washer.

The operator can adjust the brushes and sprayers from GraphWorX32 and have this information

stored for future use. When the train returns to the washer, the parameters captured during the learning mode are downloaded to the PLCs to properly adjust the sprayers and brushes. This mode ensures every part of the train is washed.

Project Summary

S.A.H. Heyd Group was selected for this application due to their industry technology leadership and the complexity of the application. All trains are electric power and, under most circumstances, water and electricity do not mix. Since all trains need to enter and exit the washer under their own power, S.A.H. had to treat the water so it would not be conductive. The GENESIS32 system is used to control the water treatment for the washer. All water used in the washing application has the minerals removed, making it non-conductive and safe to be used with the electric trains. This revolutionary process allows for trains to be washed without being taken offline. The process saves time and money and keeps the trains in service.

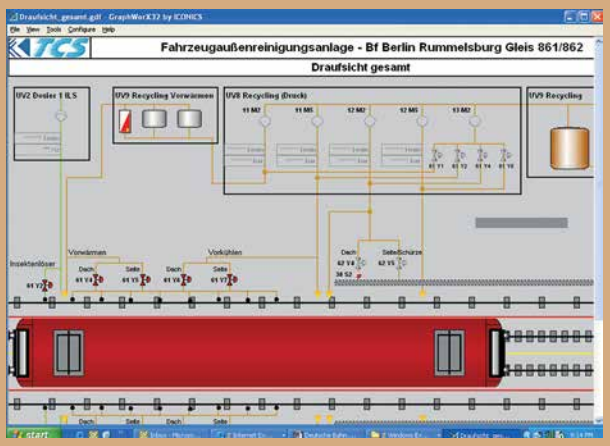
Another major feature of the learning mode is the ability to sync the left side washing with the right side. It is important to make sure the washing is done evenly. Once the operator has made the necessary changes in learning mode, he can have GENESIS32 perform an automatic sync of the left side with the right.

The GENESIS32 system monitors over 1,500 tags. Phoenix Contact PcWorX, based on ICONICS software, is used in this application. The Phoenix Interbus OPC server provides the OPC connectivity. All automation on the washing side is handled by TCS, a specialty company for washing applications. GENESIS32 is running on Windows 2000 and all alarm trending is done via Microsoft SQL Server.

Conclusion

The GENESIS32 software allows for rich 3D graphics and has the OPC connectivity needed for this very robust and “clean” application.

Train Wash Operator Control Area



Another GENESIS32 Washer Control Screen at Deutsche Bahn

Solutions Highlighted

AlarmWorX32
Multimedia OPC Alarm Management Software

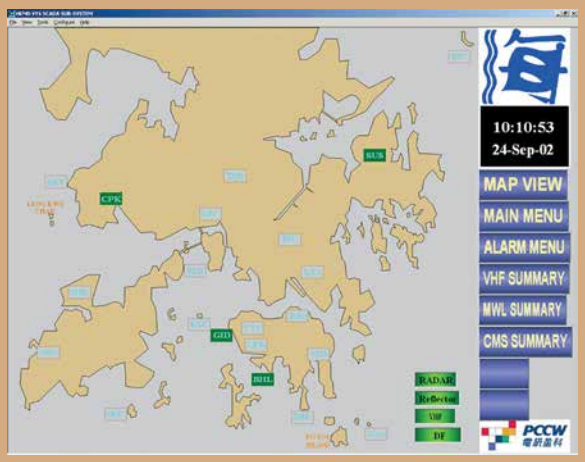
GraphWorX32
HMI Graphical Display Package

TrendWorX32
Data logging, charting and reporting software

Hong Kong Marine Department
Kowloon, China

Hong Kong Harbor

香港特別行政區海事處
MARINE DEPARTMENT
HKSAR GOVERNMENT



Harbor Overview Map

"The critical requirements of monitoring and guiding the vessels in the harbor was causing immense pressure on the operators, 24 hours a day, along with the increasing traffic. We needed an accurate and reliable system to assist the operators.
The implementation of the ICONICS GENESIS32 software, with its Web capabilities, enabled us to install the communication system with ease and offers us the ability to use and maintain the system with a high degree of reliability, with our qualified staff. The enhanced graphics, data logging and automatic report generation were essential requirements that met our design criteria fully."

Hong Kong Marine Department

About The Hong Kong Marine Department

The Vessel Traffic Centre of Hong Kong Marine Department monitors and regulates all ship movements within Hong Kong waters. Over one thousand big and small ships enter into or sail from the port of Hong Kong daily. The volume of traffic that transits Hong Kong waters to and from the ports at the Pearl River Delta increases annually. At any one time, there are over three hundred ships moored within the harbor.

The Maritime Rescue Coordination Center, which is also under Hong Kong Marine Department, is responsible for coordinating all search and rescue operations within the Hong Kong maritime rescue responsible area, which is about the entire northern part of the South China Sea, up to the west coast of the Philippines on the east and up to the 10 degree Latitude on the south.

The traffic monitoring equipment and the telecommunications equipment of both centers have recently been upgraded. ICONICS GENESIS32 monitoring software is being installed to control and monitor the performance and conditions of the newly installed radars and telecommunications equipment, which are situated on remote islands and locations.

ICONICS Software Deployed

Hong Kong Marine Department selected ICONICS GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA Software suite with AlarmWorX™32, TrendWorX™32, and GraphWorX™32 modules,

along with WebHMI and OPC Server products. Communication and data collection was a very important factor in working with the vast network of communication towers, radar units and remote terminal units.

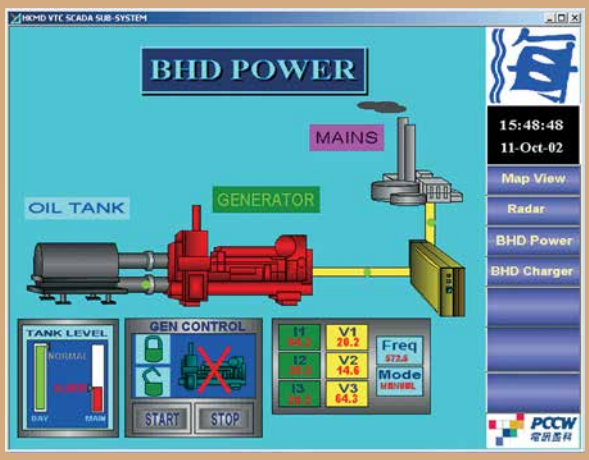
Key Features

The complete turnkey solution that included microwave link, VHF communication equipment, radar Unit, RTU and ICONICS software, was installed by PCCW Ltd. The geography of Hong Kong required the installation of 18 remote sites spread over 7 islands. ICONICS GENESIS32 software enabled rapid development and easy deployment using its modular architecture, aliases, ActiveX controls and direct publishing feature of HTML pages over the Internet. The communication towers are built on the various remote islands and locations to collect data about the presence and movement of ships within Hong Kong waters. Communication with these remote sites is critical in terms of keeping the port safe.

Project Summary

The project was to monitor the status of the Communication Towers. It was also required to maintain constant communication with all the remote towers, monitor the temperatures of all the communication equipment and immediately notify technical staff of any alarm indications to deploy an immediate fix. Live CCTV cameras are also linked within the ICONICS GENESIS32 software, which are located at all the various sites. Product stability and reliability were emphasized in the design and implementation of the project. ICONICS GENESIS32 connects 21 OmniFlex 1000 RTUs spread out over 6 islands of Hong Kong.

The senior management of Hong Kong Marine Department can now monitor and control the status of the complete communication system from any remote site. GENESIS32 proved to be a very cost effective solution, which met every aspect of the end user's design requirements.



Generator System Display at the Hong Kong Marine Department

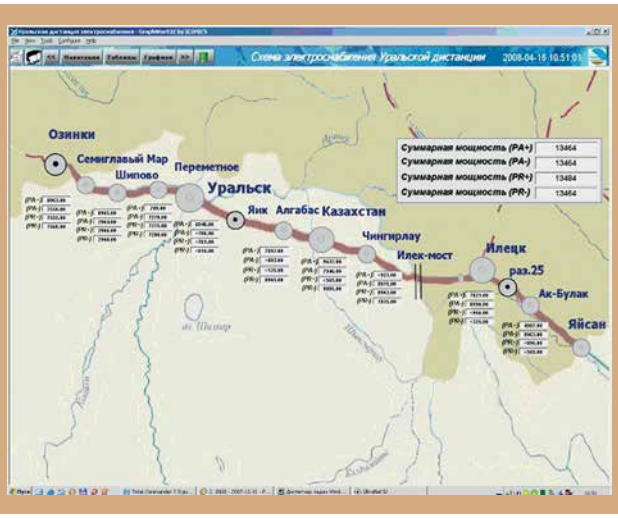
Harbor Radar Control

Conclusion

ICONICS has worked closely with Hong Kong Marine Department to make the newly installed vessel traffic management system successful in every aspect. Hong Kong Marine Department has also participated in the ICONICS End-user Support and Maintenance program so that it can access technical support personnel and receive software updates as needed.

Kazakhstan Railway
Astana City, Kazakhstan

Kazakhstan Railway's Train "Astana" at the Railway's Centennial Celebration



Kazakhstan Railway Network Monitoring Screen

> *"ICONICS' OPC technology has helped us to cut time for applications engineering."*
>
> **Boris Cherepanov**
> Chief Engineer
> Technik-Trade

About Kazakhstan Railway

Kazakhstan's railways celebrated their centennial in 2004. The state rail facilities have been incorporated into JSC National Company Kazakhstan Temir Zholy (KTZ) more than ten years ago. Kazakhstan's railroad combines about 14,000 kilometers of rails with 700 stations and KTZ is one of the railways reform leaders in the Commonwealth of Independent States (CIS).

According to KTZ's mission statement, the company works to ensure the "effective organization, coordination and maintenance of transportation processes with the purpose of the maximal satisfaction of needs of freight senders and the population at rational use of resources".

The amount of cargo and passenger traffic grows every year, inevitably leading to higher electricity expenditures. Electricity usage reform and increasing prices for energy resource are common everywhere. Therefore, implementation of an Automation System of Control and consumption for Energy (ASCUE) for the rail node was seen as a necessity. The railways need the system for real-time electricity monitoring to minimize energy use and ensure an optimum relationship between costs and the volume of work and services.

ICONICS Software Deployed

The system integrator Technik-Trade, a PROSOFT company dealer in Kazakhstan, offered ICONICS' GENESIS32™ OPC-based HMI/SCADA suite for Kazakhstan's railway ASCUE. The solution was approved by KTZ's Energy Supply Department thanks to ICONICS' ability to meet the specified project requirements. ICONICS' GENESIS32 software was selected to replace a competitor's legacy product.

Project Summary

The teamwork of Technik-Trade, KTZ's Energy Department engineers and managers, the railway division's

ASCUE specialists, the metrological service direction of the Kazakhstan Electricity Grid Operating Company (KEGOC) and the contractors' staff (from organizations including Transtelecom, Astel, TEP, RECLE and KESH) helped ensure the success of the project.

KTZ's Uralskaya, Shalkarskaya, Kzylordinskaya, Mangyshlakskaya and Atyrauskaya electric power supply divisions were among 322 substations (including 58 energy nodes and 264 standard substations) that were automated in the project. They connect to the substations via RS-485 interface, radio modification VHF (150 MHz) connections, GSM (CSD/GPRS), DSL-lines, Ethernet-technologies and satellite communication (via SkyEdge Broadband Satellite Network). Three hundred data acquisition nodes and 9,100 parameters were configured as part of the project.

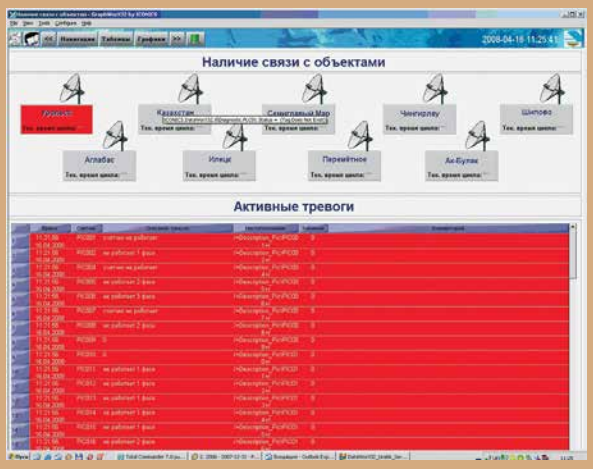
As part of the project, system integrator Technik-Trade ensured the control systems would work with KTZ's existing Microsoft software solutions, including Windows Server, Windows XP, Windows Small Business Server, Microsoft Office, Access and SQL Server.

The object nodes (railway distances) have specific demands for automation. One consideration was how the larger stations would require an equally large amount of limited electricity. Another factor in the project was the distance between where electricity was required within a node and the collecting information center (which could range from several hundred meters to over 50 kilometers).

The integrators also needed to take into account the necessity of work on non-heated and maintenance-free stations (switch-yards) without any connection lines.

There are multiple (about 10 to 50) electric objects within the bounds of each railway node and every node can contain about 500 points for control. KTZ wanted to create a solution to generalize the energy control for thousands of switch-yards with similarly structured electric parameters. All involved with development of the ASCUE system sought a qualitative and inexpensive information delivery system that could provide data from multiple remote measuring points to a central control center in as safe and secure mode as possible.

A KTZ Railway Worker Signals from Aboard the "Astana"



KTZ's Remote Automated Power Supply Divisions Connect via Satellite Network

Benefits of the System

The ASCUE system implemented with ICONICS GENESIS32 HMI/SCADA suite helps KTZ cut the cost of electric power purchasing, as well as control all levels of energy consumption. The project also supports the data exchange between analogous energy accounting control systems.

KTZ and Technik-Trade are working on expanding the system to other KTZ locations and developing a new ASCUE system for South Kazakhstan.

Kazan Metro
Kazan, Tatarstan

A Metro Train Departing a Station

Kazan Metro Monitoring Screen

About Kazan Metro

Kazan is the capital of Tatarstan, a republic in the Russian Federation, located 800 kilometers (497 miles) east of Moscow, with a population of nearly 1.5 million residents. Planners of the Kazan Metro (or "Underground") intended to have the system operational for Kazan's Millennium Celebration in 2005 and completed Phase One of their plan by completing five stations with 9 km (over 5.5 miles) of underground and 4 km (nearly 2.5 miles) of above ground rail by that deadline. The presidents of Russia, Kazakhstan and Tatarstan were honored guests and the Kazan Metro's first passengers during its grand opening.

The design of the Kazan Metro control system originated at the St. Petersburg NII Scientific Research Institute, with special attention paid to safety and mechanics, while experimental testing was performed in the city of Neva. When opened, the Kazan Metro was unique in that it boasted the complete absence of now obsolete relays, historically used for motion control and management in metros throughout the country. More contemporary onboard and station computing resources were adopted, each capable of determining conditions throughout the metro infrastructure, ensuring passenger safety.

ICONICS Software Deployed

The Kazan Metro selected ICONICS' GENESIS32™ Web-enabled, OPC-based HMI/SCADA suite for its control and visualization system, as well as the DataWorX™32 component for OPC data aggregation, bridging, redundancy and tunneling.

Project Summary

The new Kazan Metro required a unified control and visualization system for its operation. The objectives for this solution were the management and security of integrated systems including Train Dispatch and Control, Antiterrorist Protection, Power Systems/ Uninterrupted Power Supplies, Fire Safety, Groundwater Pumping and Tunnel Monitoring.

Challenges facing Kazan Metro developers included cost-control, adaptability/expandability, and communications/data management reliability.

Benefits of the System

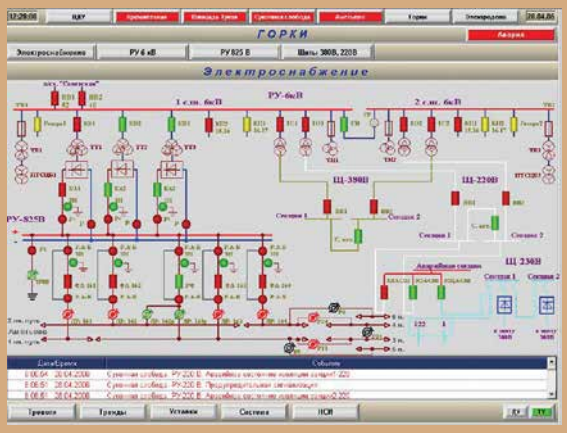
ICONICS' GENESIS32 and DataWorX32 solutions proved to meet the Kazan Metro developers' requirements. Costs were controlled due to ICONICS' PC and Microsoft operating system-based systems. Adaptability and expandability were ensured via ICONICS' commercial, off-the-shelf HMI/SCADA software and open database technology (most important to the Kazan Metro was integration with Microsoft SQL Server). Reliable communications/data management is achieved through ICONICS software's hardware agnostic approach – ensuring integration with multiple communication APIs and utilizing OPC technology.

The Kazan Metro's new unified control/visualization system now helps to facilitate the complex management of train traffic, integrated with Advantech IPCs/Windows XP and Fastwell integrated IPCs/Windows 2000. The Dispatching Desk can visualize information related to train movement, station equipment conditions, railway track conditions, duplicated optical channels and reservation data. Role-based information is available to dispatchers, engineers and the chief dispatcher at individual workstations.

Conclusion

Planners for Kazan's Metro wanted their new transportation system to reflect the city heading into its next millennium, by utilizing state-of-the-art technology. ICONICS automation software solutions were able to assist in this goal and help keep the city moving forward.

Dispatching Desk at Kazan Metro Operations



Engineering Specialist Monitoring Station

Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

DataWorX32
OPC Data Aggregation, Bridging, Redundancy and Tunneling

Engineers install state of the art Tunnel Control System

Meir Tunnel (A50 Stoke-on-Trent) Derbyshire, England

CORE CONTROL SOLUTIONS

Core Control Solutions Deliver a Fully Integrated ICONICS based Tunnel Control System

Synopsis

Core Control Solutions (CCS), an agile and growing control systems integrator based in Ilkeston, Derbyshire have delivered a state-of-the-art Tunnel Control System (TCS) complete with a fully integrated Supervisor Control and Data Acquisition (SCADA) system based on ICONICS' GENESIS64™ software.

Introduction

Meir is a suburb in Stoke-on-Trent, Staffordshire, and home to a 284 meter long road tunnel located on the A50, a major trunk road running almost 100 miles from Warrington to Leicester. The Meir area is a heavily congested urban district that connects Uttoxeter, Nottingham and the East Midlands with Stoke-on-Trent city center and the M6 Motorway, the UK's longest and possibly busiest non-stop motorway. The self-ventilating, dual-lane tunnel was built in 1997 to allow free flow traffic to bypass the Meir junction on the A50 and continue towards the M6 Motorway.

Kier Highways, one of the UK's leading highways management and maintenance teams, operate the tunnel on behalf of Highways England. The tunnel is served by an unmanned Tunnel Service Building (TSB) adjacent to the tunnel and is controlled and monitored from the main control room located in Coventry. In March 2015, Kier identified the need to upgrade their incumbent SCADA system, future proof their asset management prerequisites and drive engineering response time efficiencies. Working with their in-house teams Kier undertook a detailed tunnel control system review and subsequently identified a series of suggested control strategy changes and value propositions that were presented to Highways England for consideration.

Selection of Core and ICONICS

An ITT was released for the supply of a new TCS and CCS were awarded the contract to deliver the new system. The decision to award the contract to CCS was based on their expertise in Tunnel Control Systems, their flexible and collaborative approach and the unique technical offering from the ICONICS GENESIS64™ SCADA System.

The TCS safety systems are critical to the operation of the tunnel and ensure a safe environment for the daily road users that travel through the Meir Tunnel. Given the strategic importance of the tunnel location and the impact closures would have on the travelling public the challenge was set to upgrade the system while returning the tunnel to service every day. It was in fact Core Controls' unmatched tunnel control system experience that helped mitigate the risks involved in delivering a system that required zero system or infrastructure 'downtime'.

The project scope included:

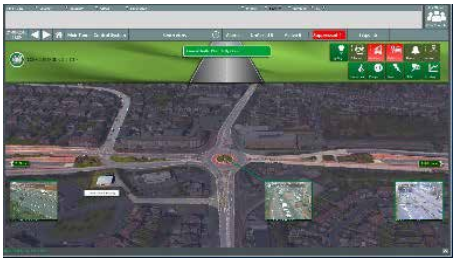
- CCTV Integration
- VAID Integration
- VMS Integration
- Lighting Integration
- Vehicle Monitoring
- Energy Control
- New Fibre Network
- Emergency Control
- New PLC System

The new TCS deployed a hot-standby PLC system complete with distributed I/O and RTU's that communicated via a GPRS data network. The TCS upgrade included the design and installation of a new resilient fibre-optic network configured in a ring typology throughout the estate providing connectivity for the tunnel assets. The tunnel assets controlled and monitored by the new TCS include but is not limited to; tunnel lighting, Variable Message Signs (VMS), Emergency Escape Lighting, Linear Heat Detection, LV Distribution, Standby Generators, Sumps and Pumps and local traffic light interfaces.

Both Kier and Core Controls recognised the GENESIS64™ platform as being the perfect fit for the Meir Tunnel TCS upgrade. The platform provided state-of-the-art system architecture with Anyglass technology being able to provide the essential visualisation of the system from any mobile platform.

TCS SCADA Mimics

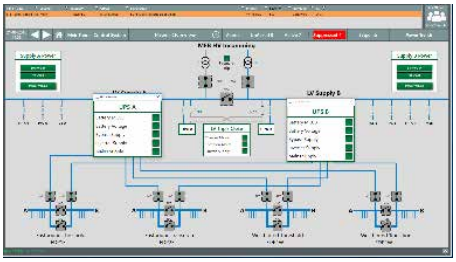
The new TCS incorporated a feature rich SCADA GUI utilising the GENESIS64™ platform:



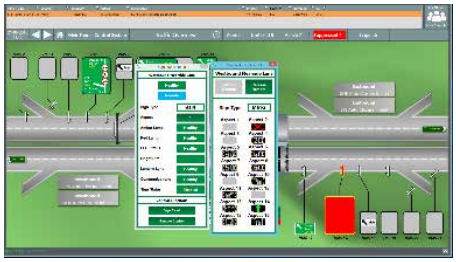
Main Overview

CCTV Integration

Facilities Integration



Energy Integration



VMSS Integration

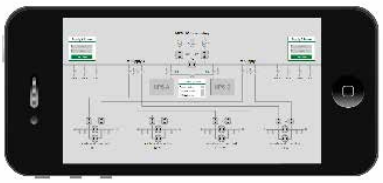
Lighting Integration

The new TCS also incorporated a feature rich mobile application powered by GEN64 AnyGlass:

Main Overview

Emergency Escape Lighting

Facilities Integration



Energy Integration

VMSS Integration

Lighting Integration

Project Delivery

Core Control Solutions executed the project delivery using their comprehensive delivery model that has been developed to meet the demands of mission critical systems. A detailed system design specification was produced with client consultation throughout. The system build and configuration was completed ahead of programme to the clients exacting standards and tested comprehensively before site deployment. CCS created state-of-the-art Graphical User Interfaces (GUIs) that were operator focused and ergonomically designed complete with mobile responsive displays utilising HTML5 technology. Kier representatives were invited for factory acceptance testing and pre-delivery training to ensure a smooth transition into service could be guaranteed.

The Benefits

Kier now have a future proof traffic management system with substantially improved data visualisation and a refurbished control strategy. 360° asset awareness has been achieved. Although the original 12 tunnel signs, energy consumption statistics, and air quality metrics in and around the tunnel are not novel to the operators, the data is being collected faster and more efficiently than ever. Just as importantly, that data is being presented cleaner and smarter than before; they've turned data into intelligence. Kier are able to swipe through dashboard screens on their phones, and see live video feeds on their desktop from Coventry. The business value lies in Kier's new-found ability to be able to respond quicker to any situation at this unmanned tunnel.

Future Plans

The TCS will be enhanced with the addition on VAID CCTV including IR technology that will be incorporated into the SCADA GUI and mobile application. The VAID system will facilitate automatic operator awareness to abnormal conditions within the tunnel. These will include pedestrian detection, stopped vehicles, smoke and slow vehicles. As the tunnel is unmanned the system will provide text and e-mail alerts and provide visual indication via the mobile platform. The new power monitoring and additional controls will be utilised to undertake an energy study and implement energy saving schemes through the efficient use of the TCS and associated subsystems. CCS are working with ICONICS to offer high-level KPI Dashboard screens for Kier management offering further intelligence to the tunnel assets with a future view to optimising asset maintenance and availability.

City Scale Efficiency

Can You Fit an Entire City in the Palm of Your Hand?

ICONICS offers advanced software solutions that help your organization's productivity. Our real-time animated dashboards, fault detection technology and energy analytics provide you with insight into operational efficiencies. ICONICS visualization and control solutions run on any mobile device and enable city scale infrastructure such as building automation, water treatment, utilities, transportation systems and much more.

Winner
Microsoft Partner
2017 Partner of the Year
Application Development Award

VISUALIZE HISTORIZE MOBILIZE ANALYZE CLOUD IoT

For More Information:
www.iconics.com/citynext

ICONICS
Make the Invisible Visible™

Mondi Packaging Paper Štětí a.s.
Czech Republic

Paper Rolls in a Mondi Packaging Czech Republic Facility

Final Control Process Station

"ICONICS' WebHMI product integrated 18 different OPC servers from different manufacturers and helped us visualize our operations using the standard Internet Explorer. The GENESIS32 product tied together our SAP, OSI PI historian, Measurex, ABB and Siemens PLCs using OPC technology. Our integrator, KONTRON CZECH, helped us build the most advanced Web-based visualization and information system for analyzing our complete Pulp & Paper plant application."

Lubomir Rulisek
Pulp Mill Manager,
Mondi Packaging Paper Štětí a.s. Co.

About Mondi Packaging Paper Štětí a.s

Mondi Packaging Paper Štětí a.s. is one of the world's leading producers of industrial packaging and paper materials. They have been using ICONICS software at its Pulp and Paper plants in the Czech Republic. The Plant receives 1,000 tons of timber daily and produces 1,500 tons of pulp and paper each day. This plant has over 100 buildings with over 1,000 people employed producing 45 megawatts of electricity within their facility. This is the largest ICONICS Web application in Europe.

ICONICS Software Deployed

The HMI/SCADA System for the Mondi Packaging Paper Štětí a.s. production plant, known as the Technological Information System (TIS), is using ICONICS GENESIS32™, AlarmWorX™32, TrendWorX™32, GraphWorX™32, DataWorX™32 and WebHMI™ software. This was implemented by the KONTRON CZECH Company, a provider of industrial automation software solutions in the Czech Republic. KONTRON CZECH served as the system integrator for the TIS, which is based on OPC Data Access, Historical Data Access and Alarm and Events communications.

Key Features

The TIS, which uses many different types of OPC servers to integrate and process real-time data from all segments of the Mondi Packaging Paper Štětí a.s. production facility, employs 20 full ICONICS GENESIS32

systems with 150 graphic screens for real-time HMI visualization of the plant's operations. An ICONICS WebHMI server provides HMI displays to more than 50 client computers running Microsoft Internet Explorer, enabling production, maintenance and management personnel to view real-time OPC data from Web browser stations throughout the facility.

Project Summary

OPC plug and play technology was critical for this extremely large application. The system integrated nine OPC servers to process real-time data from all segments of the large paper complex. An ICONICS WebHMI server, running on Windows 2000 and IIS , delivered over 150 Web pages to 70 WebHMI clients running standard Internet Explorer. This enabled production, maintenance and management personnel to view real-time plant operations throughout the facility with over 900 personal computers.

Benefits of the System

To handle the enormous amount of data generated by the plant, the plant information system (TIS) also uses ICONICS' DataWorX32 OPC data exchange product, which provided a homogenous data-collection engine for more than 4,000 real-time OPC tags and more than 5,500 historical OPC tags.

Conclusion

ICONICS has worked closely with Mondi Packaging Paper Štětí a.s. and its IT staff as well as with KONTRON CZECH, their selected systems integrator, to make this Pulp and Paper production project successful in every aspect. Mondi Packaging Paper Štětí a.s. participates in the ICONICS End-User Support and Maintenance program to keep its software updated and for access to technical support personnel as needed and is looking forward to expanding this application to its other six plants in Europe.

Pulp Processor System at Mondi Packaging

Paper Manufacturing Equipment

Solutions Highlighted

WebHMI
Web-Based Real-time Automation Software

GraphWorX32
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

TrendWorX
Data Logging, Charting and Reporting Software

Packages Out for Delivery

Poste Italiane
Rome, Italy

Posteitaliane

Supervision System at Poste Italiane

"This project was a very important milestone for Poste Italiane, as it completely changed the philosophy of how we operate."

Poste Italiane

About Poste Italiane

Poste Italiane is the national postal system of Italy, which processes over 7 billion pieces of mail in sorting centers, operates thousands of post offices and manages thousands of employees.

ICONICS Software Deployed

Poste Italiane selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite including GraphWorX™32, TrendWorX™32, AlarmWorX™32, and DataWorX™32. Also chosen was the BizViz manufacturing intelligence and business visualization suite, including PortalWorX™, ReportWorX™, BridgeWorX™, and MobileHMI™.

Project Summary

Poste Italiane achieved critical objectives with ICONICS' solutions:

- Real-time Information Access
- New Customer Services
- Processing Cost Reduction

In coordination with the system integrator, Elsag S.p.A., and the distributor, Digipoint, the solutions have been deployed in stages across all 23 facilities.

Key Features

The project focused on operational capabilities of the postal infrastructure to improve the following business functions:

- Plant Supervision, Monitoring and Control
- Monitoring of Production Progress
- Support to Plant Management
- Tracking of Flows Within Sorting Center
- Data Collection from Field Systems
- Integration with Administrative Systems

Benefits of the System

The key benefits derived from the solution include:

- Complete end-to-end value chain integration between production- and enterprise-level information.
- Access to real-time information, which empowers employees and managers to operate and collaborate at higher performance levels.
- Enables decision makers to make better decisions and react faster to unexpected situations.
- Powerful integration capabilities in connecting to and leveraging information from several diverse data sources such as sorting, address recognition, material handling tracking, weighing and packaging, financial, and production planning systems.
- Unmatched connectivity, flexibility, and visualization.

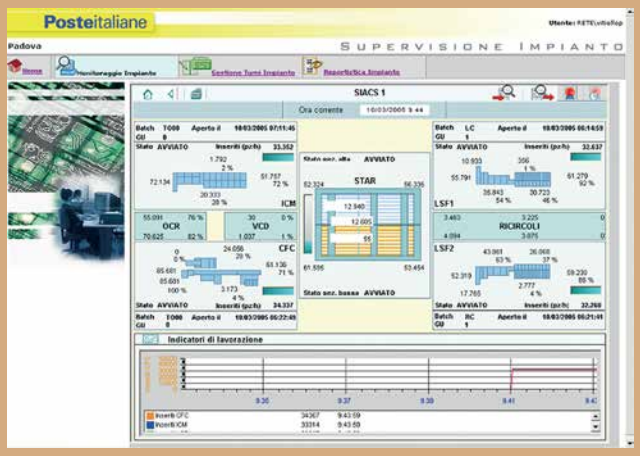
Additional value was realized by integrating this real-time manufacturing intelligence solution with various modules for entire value chain optimization. The solution is integrated with SAP (PP/DS, EM, BW-SEM, SD&LES), RFID systems and legacy systems. The project has been a major undertaking, in terms of scope and innovation achieved, that Poste Italiane has pursued for the last few years.

ICONICS' BizViz uniquely addressed very stringent visualization and connectivity requirements to deliver:

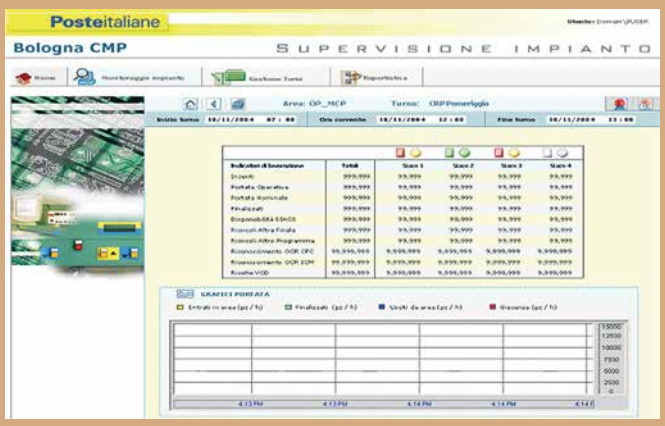
- Personalized role-based dashboards with relevant content from various systems in an intuitive framework.
- Configurable Key Performance Indicators for real-time performance tracking against set targets.
- Automated and on-demand reporting capabilities with advanced analytic functions.

Conclusion

Started in 2004, the project is being gradually rolled out to all 23 sorting centers. The level of business process automation is steadily increasing from the original 40% to the target of over 85%. The critical success factors include close cooperation with the customer and fast deployment with the local system integrator.



System Start Monitoring at Poste Italiane



Plant Monitoring with Capacity Diagram

Solutions Highlighted

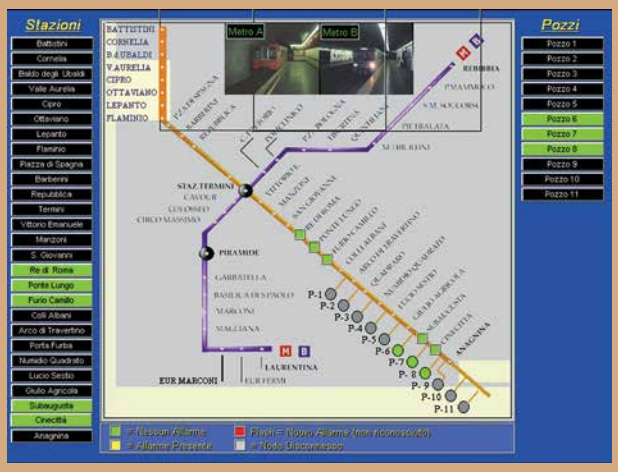
PortalWorX
Real-Time Collaboration and Visualization Dashboard

MobileHMI
Instant KPI and Alerts for Mobile Devices

A Stop Along the Met.Ro. Rail Line

Rome Metro S.p.A.
Rome, Italy

Met.Ro.
Metropolitana di Roma s.p.a.



Rome Metro Line Overview

> *"The ICONICS system has substantially reduced the length of time of subsystems failures because of the efficient data visualization capabilities and early notifications."*
>
> **Rome Metro S.p.A.**

About Rome Metro S.p.A.

The Rome (Met.Ro.) local government organization runs the Metropolitan Rome rail and surface bus lines within the city of Rome, Italy. They also operate some regional bus lines as well. There are two main metro rail lines with a total of 53 stations that are served. A third line with 34 additional stations is being built currently. Each line is approximately 22 km in length.

ICONICS Software Deployed

Met.Ro. – Metro Rome selected ICONICS GENESIS32™ (GraphWorX™32, TrendWorX™32, AlarmWorX™32 and ScriptWorX™32) to implement on their first of three rail lines. They are using GENESIS32™ to monitor and control the metro line from a centralized location. The software system also provides alarm notification for the coordination of emergency actions. The software was designed and installed by Automation Services S.r.L., a systems integrator, and was implemented over a two-year period.

Key Features

The ICONICS GENESIS32™ software suite incorporates smart symbols that were used by Metro Rome to automatically create large portions of their graphic screens. The import / export tools in the software suite allowed Metro Rome to create configuration databases using Microsoft Excel™ and other text processors. Also provided were global (multiple-file) search/replace features that enabled Metro Rome to update hundreds of graphic files automatically. The Metro Rome control system is based upon 70 ABB PLCs in a distributed architecture with interlocking logic executed upon alarm notification. Locally, the subsystems are connected via Modbus RTU. The system has 8 GENESIS32 nodes, 7 alarm servers and 6 browser

nodes. Over 7,000 digital and 500 analog tags are incorporated. The GENESIS32 system monitors 3,000 alarms that are both centralized and distributed across the station network for operator intervention.

Project Summary

ICONICS GENESIS32 software system was installed at Metro Rome to centralize security monitoring and provide the status of auxiliary equipment at each of the remote stations on the rail line. The types of auxiliary equipment being monitored include ventilation systems, fire systems, moving stairs, elevators, normal and emergency lighting systems, uninterrupted power supplies, inverters etc. The software system also provided the ability to coordinate emergency actions in case of fire in the stations to enable the necessary operational strategies of ventilation systems that had to be coordinated with the moving stairs and elevators at such affected stations on the rail line.

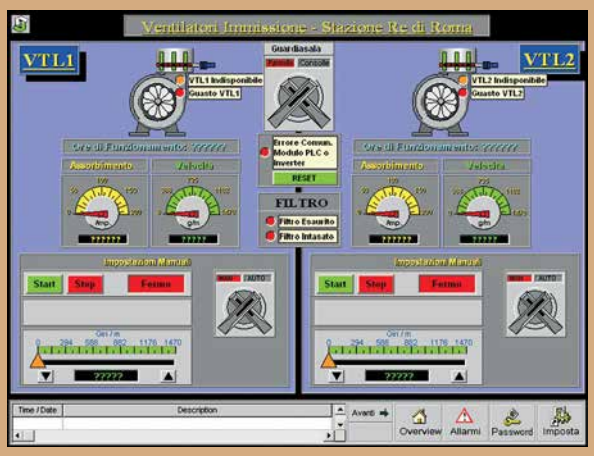
After the installation and extensive system testing, modifications to their complex logic of system interconnects for emergency notifications identified the most common alarms and their causes, enabling Metro Rome to better organize their responses.

Benefits of the System

The ICONICS GENESIS32 software system connects with a Metro Rome mainframe computer via a WAN which communicates data using OPC at 2 Mb/sec. Operational data is collected from the software system for evaluation, trending and analysis for the modification of the Metro Rome implementation of alarm notifications. Plans for future expansion of the installed software system include the ability to perform diagnostic functions by operators of the subsystems at the individual stations upon alarm notification prior to elevating the emergency further, providing public information to their customers and connecting ticket counters and emergency phones. Overall, Metro Rome has increased the rail system efficiency and operational uptime performance with the use of the ICONICS GENESIS32 software system with early notification of subsystem failures, which afforded timely resolution of any problems reported.

Conclusion

ICONICS has worked closely with Metro Rome to make this transportation management project successful. Metro Rome participates in the ICONICS SupportWorX maintenance program to keep its software updated and for access to technical support personnel as needed.

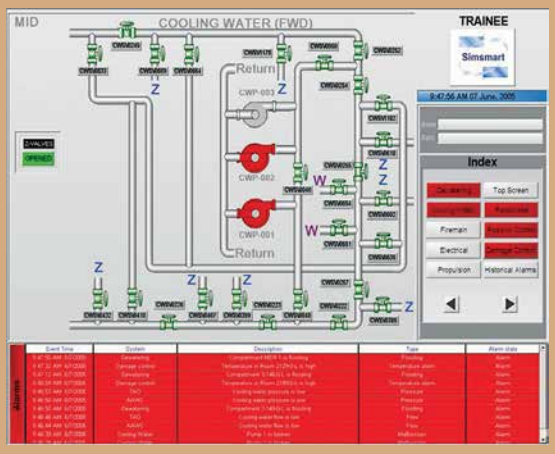


Ventilation Monitoring and Control for Rome Metro S.p.A.

Station Overview Screen

Simsmart Provides Applications for Military Ship Design, Training and Personnel Tracking

Simsmart
Brossard (Quebec), Canada



A Trainee Station View by Simsmart

About Simsmart

Simsmart Inc., of Brossard (Quebec), Canada, is a provider of process systems design software, process performance analysis, process training solutions and related application engineering. Simsmart's Engineering Suite and TPTS (Total Platform Training System) multidiscipline, physics-based, dynamic modeling/simulation design and training tools are the result of extensive research and development. The tools are used in a wide range of military and industrial applications where liquid and gas processes, Heating Ventilating and Air Conditioning (HVAC), associated AC/DC electrical systems and related process controls are involved.

Simsmart's products provide advanced engineering and cost effective solutions for both new construction and retrofits. The company looked to GENESIS32™, in particular its visualization capabilities, to meet integral training system requirements.

ICONICS Software Deployed

Simsmart selected ICONICS GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite. The training modules developed by Simsmart utilize the rich GraphWorX™32 visualization development environment for creating eye-catching animated displays. The TrendWorX™32 module is used for simulated data collection, logging, charting, reporting and analysis while the AlarmWorX™ module is used for simulating real life alarms and events. The ICONICS OPC Simulator driver, available as a free download from ICONICS.com, is also used for simulating some of the real world situations.

Project Summary

The displays are created via a GENESIS32 GraphWorX environment where graphical objects are placed on a window and connected to OPC resources for Input/Output. The controls are simulated by using ICONICS Simulator OPC Server and Simsmart's Engineering Suite. Trainees operate the emulated control panel by pushing buttons, turning knobs, manipulating sliders, etc, as if performing the tasks themselves in real life.

Each training environment can have its own separate configuration for trainee(s) and instructor(s). The instructor layout display can be used as a template to display operating procedures to be monitored.

The GraphWorX GUIs for Instructors can also be

configured to display malfunctions to be injected such as an eductor failure or bulkhead failure (by actuating sliders) to ensue progressive flooding. The instructor actions have a hand shake with the LPMS to initiate incidents, monitor tasks or activate crew actions.

Benefits of the System

Utilizing award-winning GraphWorX software, trainee stations consist of emulated local control panels or duplicated machinery control system operator pages along with all related controls simulated. To avoid negative training, the look, feel and functionality is duplicated as close as possible to the real system. This allows trainees to be more "hands on", although remaining in a secure learning environment.

The benefit is two-fold in that instructors can introduce intentional failures into the training scenario and immediately measure trainee response, in as realistic a manner as possible.

Conclusion

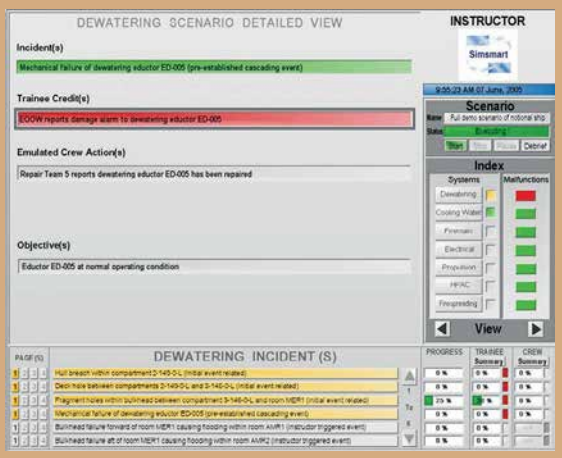
Simsmart devises unique methods and solutions to help customers resolve seemingly unsolvable engineering design problems.

ICONICS, with the GENESIS32 suite of OPC Web-enabled HMI and SCADA applications (the multi-faceted GraphWorX in particular) has reinforced Simsmart's ability to continue to meet this challenge.

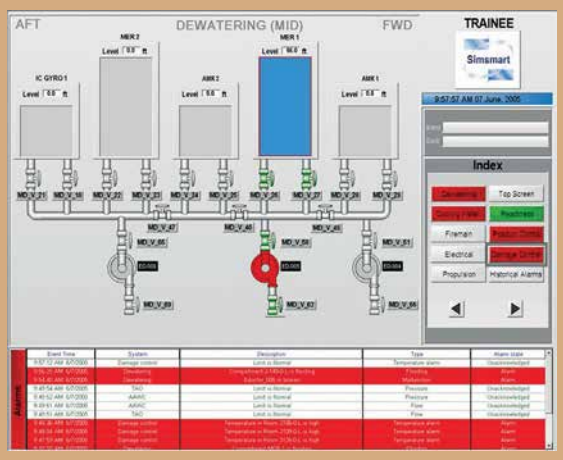
Solutions Highlighted

GraphWorX
HMI Graphical Display Package

TrendWorX
Data Logging, Charting and Reporting Software



An Instructor GUI Example by Simsmart



A Mock Malfunction Introduced into a Simsmart Training Application

Case Study Details

Simsmart set out to enhance a training system that could perform a variety of functions including:

- Emulating Local Control Panels with Control Functions
- Duplicating Machinery Control System Operator Pages
- Multidiscipline Process Simulation Tool
- Lesson Plan Management System

Xi'an Xianyang International Airport

Xianyang, Shaanxi, China

XI'AN XIANYANG INTERNATIONAL AIRPORT
西安咸阳国际机场

Inside the Xi'an Xianyang International Airport Terminal

Main page of Xi'an Xianyang Airport's Control Screen, Created with ICONICS GENESIS64™

About Xi'an Xianyang International Airport

Located in Xi'an, the geographic center of China, Xi'an Xianyang International Airport (XXIA) is not only the biggest transportation hub in Northwest China, but is also China's eighth largest airport. XXIA covers over five and half square kilometers of land.

The airport includes three terminals. The first terminal (T1) has a building area of 10,000 square meters. The second terminal (T2), has an area of 90,000 square meters, with 59 aircraft stands. Terminal 3 is spread out over 260,000 square meters. With a total area of 360,000 square meters, Xi'an Xianyang is able to handle over 30 million passengers per year.

ICONICS Software Deployed

Working directly with ICONICS China, Xi'an Xianyang International Airport selected: ICONICS GENESIS64™ HMI/SCADA suite (including the GraphWorX64™ rich HMI/SCADA data visualization tool and EarthWorX™ GEO SCADA); Hyper Historian™ high-speed, robust data historian; WebHMI™ Web-based, real-time automation software; and AnalytiX® suite of analytical tools (including the Facility AnalytiX predictive software for facilities management and the Energy AnalytiX advanced energy management software).

Project Summary

The growth of Xi'an Xianyang International Airport made it necessary to seek a monitoring and control solution that could handle communication with multiple different data sources as well as scale to the wide array of equipment that is continuously added. One primary concern was energy use and temperature control throughout the 360,000 square meters of indoor airport space. China Western Airport Group and the Xi'an Airport Construction Co., Ltd. created a dedicated energy center that could assist them in providing comfortable temperatures for millions of passengers as well as the great number of people who work within the airport facilities.

As the airport expands, so too does its energy use, as well as the complexity of its energy system. Airport

officials required an HMI/SCADA system with a safe, reliable, cost-saving energy management component. After consulting with other region's airport management, it was decided that ICONICS GENESIS64, along with other integrated software, would be the best choice.

Redundant servers in the Xi'an Xianyang monitoring center run GENESIS64, WebHMI and Hyper Historian (for data storage). Multiple users are provided with access authorization for remote access and monitoring. Airport management appreciates the ability to set different permissions so that certain users can only access specific content and execute operations with their associated permissions.

Heat Station Control Using EarthWorX™ GEO SCADA

A 3D Overview of a Boiler in Xi'an Xianyang International Airport

Benefits of the System

Xi'an Xianyang was especially interested in ICONICS software's ability to handle data connections, 3D visualization, advanced HMI/SCADA graphical tools, system monitoring and data/alarm analysis. In addition, the airport sought to take advantage of the AnalytiX suite of facility and energy analysis tools. Facility AnalytiX now provides fault analysis for multiple airport systems, helping personnel to take preventative actions and reduce maintenance costs and time. Energy AnalytiX helps to collect, analyze, monitor and manage the airport's energy usage, from its energy center, in order to control its energy-related costs.

According to the executives at Xi'an Xianyang International Airport, "GraphWorX64 3D visualization and EarthWorX GEO SCADA make it easy to keep track of the distributed pipelines and complex equipment. GENESIS64 provides amazing monitoring of piping valves and pumping stations, as well as multiple system fault analysis, via AnalytiX, using a variety of charts. The benefits of deploying ICONICS software have improved the overall management of the energy center and greatly improved both the heat production management and operational efficiency in the airport."

Conclusion

Xi'an Xianyang International Airport was initially drawn to ICONICS HMI/SCADA software due to its GIS (Geographic Information System) and 3D visualization capabilities. They were quickly just as impressed with the software's energy, facility and alarm analysis capabilities, as well as with its data connectivity and fast, robust historian. With such features at its disposal, the airport expects to reduce its energy use while its productivity soars.

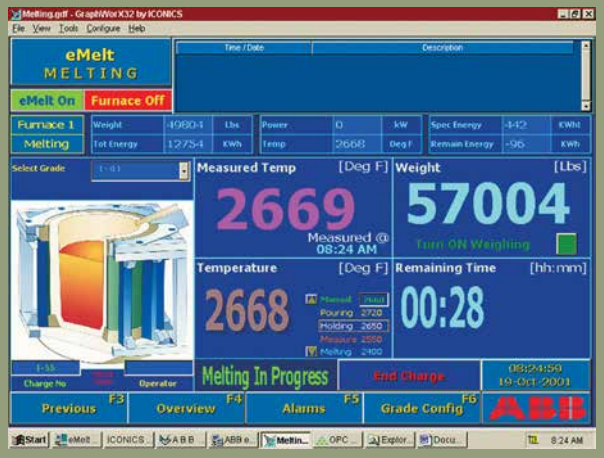
"GENESIS64 gave us unparalleled flexibility for creating the content we needed. We just plugged [it] onto our system to communicate with all our existing hardware interface drivers and software. With its GraphWorX64 tool, our HMI visualizations are much more intuitive and it was easy to do it myself."

Greg Telesz
Director of Engineering
VEC Technology, LLC

MANUFACTURING & MACHINE BUILDERS

ABB Foundry Group
New Berlin, Wisconsin

ABB Foundry Manufacturing in Progress



Melting Control Screen at ABB Foundry Group

> *"GENESIS32 was selected for this project due to its ease of use for creating graphics and strong integration with Microsoft products."*
>
> **Anil Baila**
> Sr. Systems Engineer
> ABB Foundry Group

About ABB Foundry Group

The ABB Foundry Group in New Berlin, WI has designed their eMelt product around ICONICS GENESIS32 software. ABB is a leader in power and automation technologies that enables utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs around 115,000 people worldwide.

ICONICS Software Deployed

GENESIS32™ Enterprise edition is the HMI/SCADA solution under the hood for ABB's eMelt product offering. GraphWorX™32, AlarmWorX™32 and TrendWorX™32 are all used in the eMelt application. This is a complete solution deployed on a single node. From GraphWorX32, operators can see a graphical representation of what is happening inside the melting furnaces. They are able to control the temperature, view the weight, and see the remaining time left before pouring. AlarmWorX32 is used for all alarms needing attention during the heating and melting stages. The TrendWorX32 component allows operators to view real-time trends of the process at all stages. Data tags can be dragged and dropped into a trending area during runtime for real time trending.

Key Features

The eMelt product is an MMI, SCADA and MES global solution for ABB's Foundry segment. This quick-to-learn and easy-to-use product, based on OPC, is controller (PLC) independent, supports multiple languages and works with different unit systems. The system provides the monitoring and controlling of foundry processes for as many as four furnaces. The product is configured to individual foundry requirements and operations. It can connect to temperature measurement devices, analyzers and spectrometers and offers a variety of operational reports.

Project Summary

The eMelt foundry system, based on GENESIS32, was implemented by the ABB Foundry Group. Thermocouples, a type of spectrometer, are connected to the ABB Digital Inter Control Unit (DICO). This DICO then interfaces to GENESIS32 for operators to monitor and control the melting process.

The GENESIS32 application is also communicating via OPC to a Modicon PLC as well as PLC5 and ControlLogix hardware from Allen Bradley. One of the requirements for this application was to be able to handle connectivity to all the above-mentioned devices from a single Windows-based server. The entire system for one melting station only contains about 300 I/O points. However, the points can be spread across different controllers.

Other vendors and internal solutions were considered for this application. ICONICS was selected due to its ease of use in creating graphics, its small footprint, strong integration with Microsoft products, and open architecture based on OPC. All data is logged to Microsoft Access via ADO and Visual Basic. Microsoft Visual Studio and Office is also used in conjunction with this system running on the Windows 2000 operating system.

Benefits of the System

ABB was able to get their foundry monitoring and control product (eMelt) to market quickly and cost effectively by partnering with ICONICS.

Conclusion

The eMelt project is key to ABB's success in foundry applications. The project is a global solution and will be joining ABB's Industrial IT family.

Metal Pouring at ABB Foundry Group

Sintering Control Screen

Solutions Highlighted

TrendWorX
Data Logging, Charting and Reporting Software

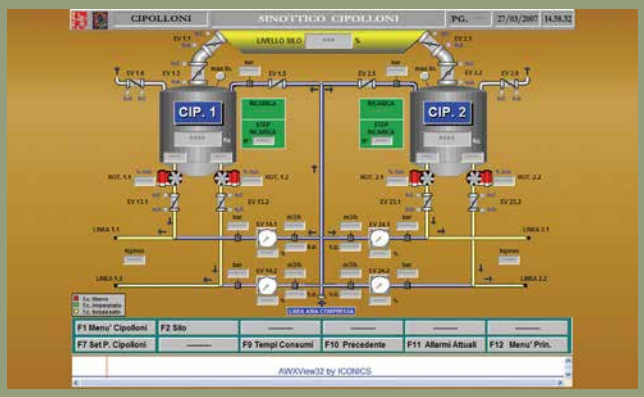
GraphWorX
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

Sparks Fly During Steel Production at AFV Beltrame S.p.A.

AFV Beltrame S.p.A.
Vicenza, Italy

GRUPPO AFV BELTRAME



An AFV Beltrame S.p.A. Steel Plant Control Screen

About AFV Beltrame S.p.A.

The Beltrame Group is a European leader in the production of commercial rolled steel sections, as well as the main producer of special bars for shipbuilding and earth-moving machines. Today, the Beltrame Group is in the forefront of technology and innovation within this industry.

It boasts a century-old tradition, started by the Beltrame family at the end of the 19th century and continuing through its Laminés Marchand Européens subsidiary. The Beltrame Group's distinctive elements are the quality of the product and the ability to satisfy customers' needs through excellent service. With nine strategically located plants, it is the only European steel rolling operation with production of over three million tons.

ICONICS Software Deployed

AFV Beltrame S.p.A. has selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite to assist in the production of its rolled steel from iron scrap. Currently, the company has about 30 installations between its steel plants and rolling mills.

Project Summary

AFV Beltrame S.p.A. started a search for an HMI/SCADA solution to better visualize and control processes within its multiple plant locations. Examples of such processes include lowering pollution within fusion furnaces, cooling, stocking and the insertion of iron alloys in silos. Each plant would have its own graphical interface, settings and alarm requirements.

In addition to a robust system for the set-up, monitoring and control of its plants, AFV Beltrame S.p.A. required a solution that was easy and fast to develop and deploy. The selected system would need to easily handle several thousand tags and I/O points, working with existing Allen Bradley PLCs. An additional need was the integration with the company's existing Microsoft SQL Server installation. The company also runs Microsoft Office and Visual Studio.

Benefits of the System

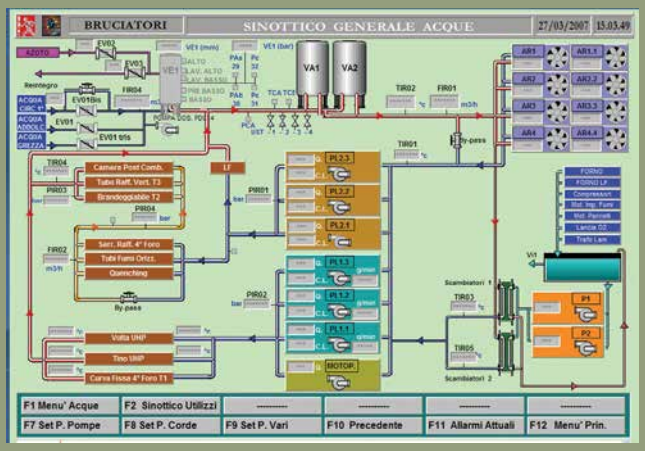
The European rolled steel producer has been happy since the initial rollout of its ICONICS GENESIS32 solution. AFV Beltrame's new HMI/SCADA system has allowed it to save thousands of euros as it speeds up its own internal application development time.

GENESIS32 also provides the manufacturer with the ability to better adapt to process or environmental changes. This led to the company's wide roll-out from its Vicenza headquarters to locations in S. Didero, Marghera, S. Giovanni Valdarno, S. Giorgio Nogaro and Villadossola.

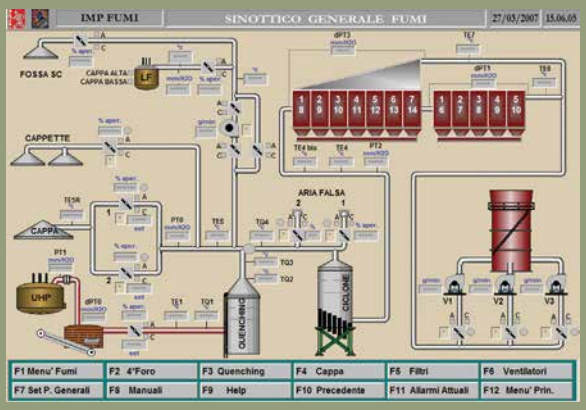
AFV Beltrame S.p.A. also selected GENESIS32 as it plans to utilize the software to adapt to additional applications beyond the present fusion furnace pollution abatement, plant cooling and iron alloy stocking/silo insertion.

Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization



Water Systems Summary Screen at AFV Beltrame S.p.A.



Air and Smoke Handling Summary Screen

ICONICS' scaleable software will also prove its value when the European steel provider decides to add to its existing Microsoft technology or its number of licenses/seats.

Conclusion

AFV Beltrame S.p.A. was able to save both time and money by implementing ICONICS' HMI/SCADA solutions. Development time is faster. Adapting to change is easier. And operations for the steel manufacturer keep rolling thanks to GENESIS32.

Case Study Details

- Fast, Easy Development and Deployment
- Familiarity with Steel Industry Processes
- Low Total Cost of Ownership
- Integration with Existing Technology, Including Microsoft Solutions

ATICS, Ltd./
The Ceramic Factory
Botevgrad, Bulgaria

Bricks in Storage at
The Ceramic Factory – Botevgrad

A Factory Control Screen at The Ceramic Factory

About ATICS, Ltd./ The Ceramic Factory - Botevgrad

The Ceramic Factory - Botevgrad is one of the leading suppliers of construction materials for this booming industry in Bulgaria. Botevgrad is a small town near Sofia, the capital of Bulgaria, known for its industrial area, where many big companies have built factories and subsidiaries. ATICS, Ltd. is the ICONICS sales channel partner working with LogiSoft, a systems integrator, to bring advanced industrial automation software solutions to the Bulgarian brick maker.

ICONICS Software Deployed

The Ceramic Factory - Botevgrad, working with ATICS, Ltd and Logisoft, elected to install ICONICS' GENESIS32™ V9 Web-enabled, OPC-integrated HMI/SCADA suite, as well as ICONICS' ReportWorX™ enterprise reporting/charting/analysis software, a component of ICONICS BizViz™ Manufacturing Intelligence/Business Visualization suite.

Project Summary

The Ceramic Factory - Botevgrad has experienced recent growth as the construction industry continues to grow in Bulgaria. The company required visualization of the manufacturing processes involving its furnaces as well as of the transportation line for the produced bricks. The factory also sought an additional module for reports to help management mitigate downtime issues and increase productivity.

The company realized that as business grew, it would require premium, robust solutions to meet its visualization, control and reporting needs. The selected solution would need to integrate with the company's existing VIPA PLCs, approximately 150 I/O points and KEP OPC Server for Siemens PLCs. In addition, The Ceramic Factory – Botevgrad sought HMI/SCADA and reporting solutions that would also work with its Microsoft Access database and its desktops and servers running Microsoft Windows XP Professional.

Benefits of the System

The Ceramic Factory – Botevgrad soon realized many of the benefits of implementing ICONICS' industrial automation software solutions. The construction materials manufacturer was pleased that the installation was completed within six weeks of request, and easily performed by its system integrator LogiSoft, with assistance by ICONICS channel partner ATICS, Ltd.

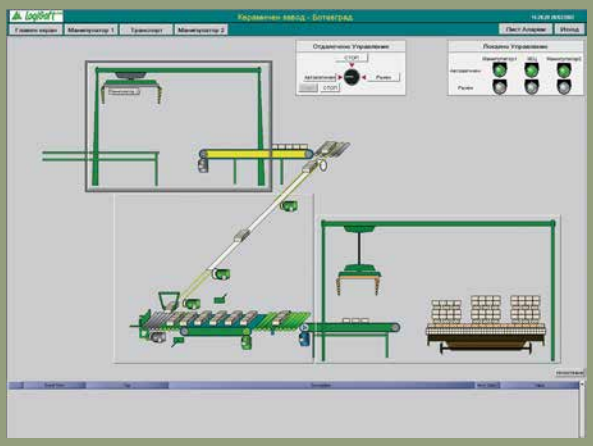
The company was also able to save on anticipated internal and external system development costs. Implementing ICONICS GENESIS32 and ReportWorX required no need for additional scripts or programming. Additionally, the firm recognized the benefit of solutions, such as GENESIS32, that are integrated with OPC technology – providing a basis for improved system communications and allowing for secure, open connectivity from plants and facilities to the enterprise level.

More cost-savings for The Ceramic Factory – Botevgrad are attributed to the resulting increase in the number of report options. The new reporting capabilities via ReportWorX allow the company to compile data from a wide array of different data sources in order to compile KPIs such as equipment downtime statistics that can be acted upon in order to increase efficiency and save money.

Conclusion

Faced with record growth in its industry, The Ceramic Factory – Botevgrad ensured it could control costs as well as it could control its furnaces and transportation line by selecting ICONICS' software solutions. With GENESIS32 and ReportWorX, the construction materials supplier is building a firm foundation for its own future.

Manufacturing Equipment at The Ceramic Factory - Botevgrad



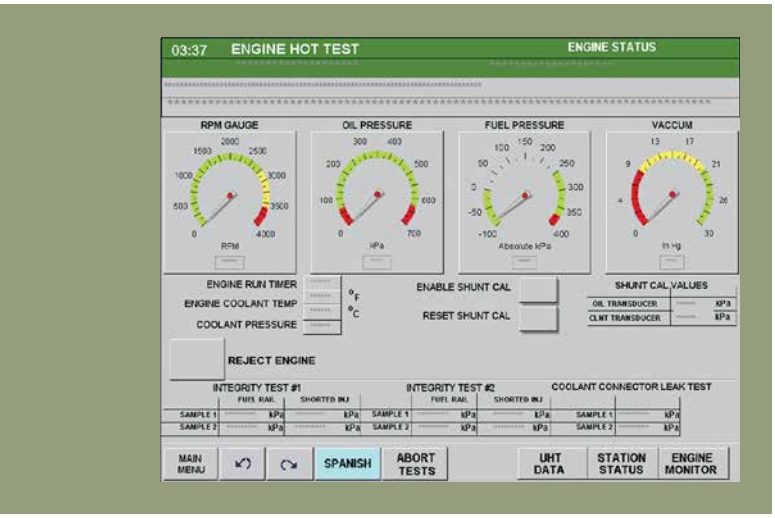
Brick Transport Controls

Case Study Details

- State-of-the-Art Visualization of Manufacturing Processes
- Easy, Intuitive Process Control Options
- Advanced Reporting with a Wide Range of Integration Options
- Robust, Secure OPC Connectivity

A Ford Motor Production Facility

Comau Pico
Dearborn, Michigan



Engine Hot Test Display

"ICONICS software allows usage on multiple product lines using the same architecture, thereby increasing throughput and decreasing implementation time. GENESIS32™ reduces the number of databases on a system typically from 8 to 4, and allows PLC development software to run on PCs during the production process. GENESIS32 also accelerates software modifications to the machines."

Jack Porter
Comau Pico

About Comau Pico

Comau Pico is an innovative leader in industrial automation. As a member of the Comau Group, they are part of the largest full-service automotive supplier in the world. With over 50 years of experience in automated assembly tooling, Comau Pico offers an unparalleled scope of engineering and services to the North American market. Using the latest technology, they deliver complete turnkey systems and continually meet and exceed the design and manufacturing needs of their customers. Comau Pico is an Authorized OEM of ICONICS and uses GENESIS32™ software extensively on their systems.

ICONICS Software Deployed

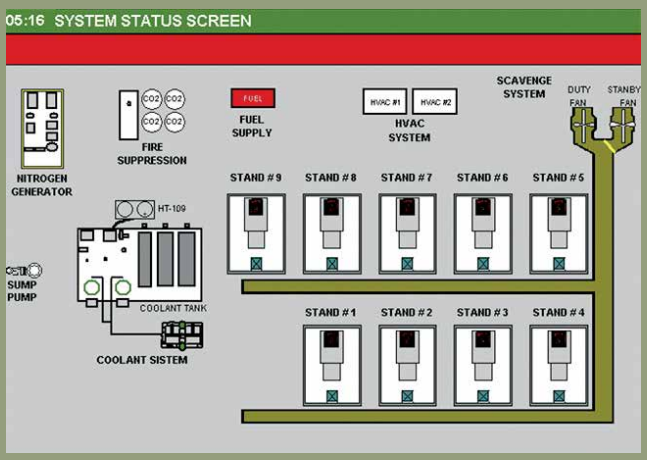
Comau Pico has installed ICONICS GENESIS32™ HMI/SCADA software suite (including GraphWorX™32, TrendWorX™32, AlarmWorX™32 and ScriptWorX™32) at Ford Motor Company on the engine test stands, designed by Comau Pico at their Dearborn, MI engine plant. Comau Pico has also installed this same software at other Ford plants including those in Mexico and Canada. GENESIS32 was used primarily for its ease of use, speed and its 100 percent OPC compliant capabilities.

Key Features

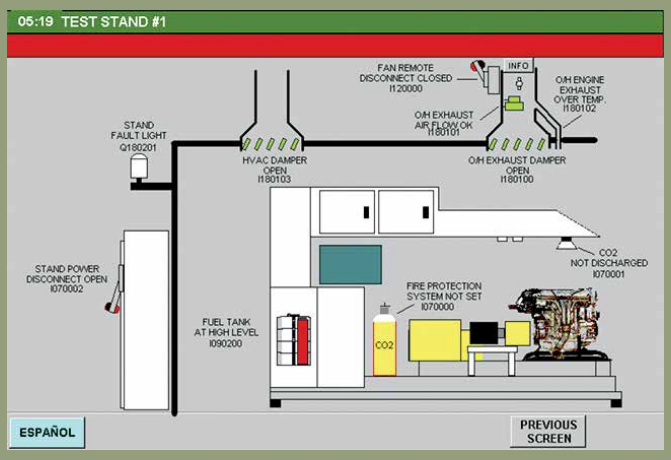
Ford Motor contracted with Comau Pico to design and install multiple cold and hot test stands at the Dearborn Engine plant. There are multiple test stands per production line, with each test stand having several hundred tags.

Project Summary

Ford required 100 percent testing of every engine produced at this plant (4 & 6 cylinder engines) along with the logging and trending of results for both cold and hot testing. Cold testing does not use gasoline and the engine is basically driven by an external motor. All fluids are installed and the engine is run through its cycles. Hot testing involves adding gasoline and actually starting and running the engine through various test cycles. The test stands perform measurements on the heating and cooling of fluids as well as exhaust gases, spark timing and advancement through the RPM range. Testing is also done on the air combustion mixture of exhaust gases and fuel mixtures of the injection systems. All testing parameters are recorded and trending data stored via LAN to a historical database. Comau Pico has installed over 50 of these engine test stands into six Ford engine plants. Ford is also using ICONICS GENESIS32 software on "In Process" test stands at other facilities.



System Status Screen



Test Stand Monitor #1

Reporting and System Benefits

Ford uses ICONICS DataWorX™32 and GraphWorX32 to enable and sequence the recording of the testing and production area of each test stand. This parameter information is then communicated via the internal Ford Motor local area network to an Oracle®-based database called POSMON®. This testing information is now available to all authorized users who have access to this database, from management to plant floor supervisors. Production rates, failure rates and downtime analysis maintained for each engine production line are used by Ford to schedule preventative maintenance repair and replacements of equipment and systems on the production lines. These performance rates can also be used to manage their supply chain of components and raw materials needed to manufacture engines.

Conclusion

ICONICS has worked closely with the Comau Pico Group and Ford Motor Company to make this engine testing project successful in every aspect. Ford Motor Company participates in the ICONICS SupportWorX maintenance program to keep its software updated and for access to ICONICS technical support personnel as needed. Comau Pico continues to expand the use and implementation of ICONICS software products in their turn-key solutions that they bring to their automotive customers.

Almost Every Third Car in Europe is Delivered with Tires from Continental

Continental AG
Hanover, Germany

Continental Tire Manufacturing In Process

> *"Continental selected ICONICS automation software solutions due to the company's product scope, in terms of technical solutions, and the flexibility of its available modules. Continental favored ICONICS' strong customer orientation, the flexibility and availability of its employees, and the fact that they were solution-oriented."*
>
> **Sebastian Amlong**
> Project Lead, DOPAC

About Continental AG

Continental AG (www.continental-tires.com), headquartered in Hanover, Germany, is the world's fourth largest tire manufacturer. Founded in 1871 as a rubber manufacturer, the company now contains additional divisions handling brake systems, interior electronics, automotive safety, powertrain/chassis components, tachographs and additional parts for the automotive and transportation industries. Almost every third car in Europe is delivered with tires from Continental. Its Division Tires features tire brands like Continental, Uniroyal, General Tire, Semperit, Barum and many more. Today the company has over 227,000 employees in 56 countries.

ICONICS Software Deployed

Continental AG selected ICONICS' HMI/SCADA suite, in addition to the high-speed, reliable, robust plant historian.

Project Summary

Continental sought an update to their process analysis and control systems for their passenger car, light truck, bus and truck tire production sites, within 18 separate locations worldwide. The company's initial aim was to develop a system that could handle near real-time data collection from production equipment for process and product analysis and optimization. Thus, "DOPAC" was born.

DOPAC was the internal project name initiated by Continental, standing for its planned "Database for Online Process Analysis and Control". A pilot project began in 2016 in the company's Puchov, Slovakia plant, with a year spent on prototype development. Continental decided early in the process to move on from installed legacy systems and, after considering

multiple vendor solutions, decided upon ICONICS HMI/SCADA and data historian to comprise the heart of DOPAC.

Continental's new system was intended to steer and continuously improve the company's production processes based on statistical process control (SPC) measurement of product performance-relevant data. A taskforce was put together to clearly define the company's IT requirements, as the right pertinent performance data was deemed necessary for continuous improvement. On top actual product and process data were for intended advanced analytics.

During the pilot phase, Continental prioritized its expected core functionalities for their new system. High on the list was real-time data collection. Another necessity was a redundant architecture, including data buffering at sources. The company also highly valued integrating specification systems, high-rate data compression and data mapping.

Next on the company's list of priorities was process analysis. Their selected system needed to include a mechanism for decision and escalation workflow, as well as for SPC online. Rounding out Continental's core functionality priorities were dashboarding and archiving abilities.

At the end of Continental's pilot project, DOPAC will be installed in two locations on more than ten pilot machines in each facility. The company continues to validate DOPAC's business use case through the performance of defined technical test cases. When finalized, the system will be expected to work with multiple brands of PLCs, handle initial groups of sensors/tags defined by central functions, and an interface with the company's current MES systems.

Benefits of the System

Continental selected ICONICS automation software solutions due to the company's product scope, in terms of technical solutions, and the flexibility of its available modules. Continental favored ICONICS' strong customer orientation, the flexibility and availability of its employees, and the fact that they were very solution oriented. Among the perceived benefits of ICONICS automation software, Continental highlighted its transparency, Web-based utility, and light installation footprint.

Condition Testing for Continental's WinterContact Tires

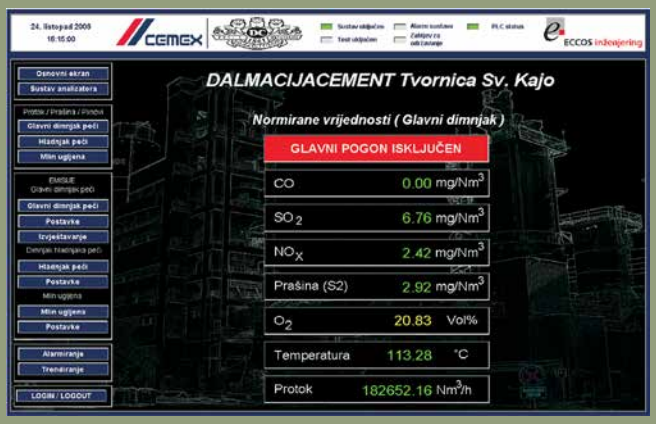
Testing at Continental's Contidrom Track Near Hannover, Germany

Conclusion

Nobody knows product "rollout" better than a tire manufacturer. Following the pilot phase of its DOPAC system, Continental expects to roll out ICONICS HMI/SCADA and data historian solutions throughout its remaining 20 passenger car, light truck, bus and truck tire production facilities throughout the world.

Dalmacijacement d.d.
Kaštel Sućurac, Croatia

Dalmacijacement d.d. Cement Production Plant Sveti Juraj, Croatia



Dalmacijacement d.d. Startup Screen at Sveti Kajo, Croatia

About Dalmacijacement d.d.

Dalmacijacement d.d., of Kaštel Sućurac, Croatia is part of the CEMEX consortium (www.cemex.com), one of the top building materials companies in the world. The company is the Croatian market leader in cement production, with three factories (plants): Sveti Juraj (Saint Juraj), Sveti Kajo (Saint Kajo) and 10. Kolovoz.

ICONICS Software Deployed

Dalmacijacement d.d., working with systems integrator, ECCOS inženjering, selected ICONICS' GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA Suite (including GraphWorX™32, AlarmWorX™32 and TrendWorX™32 components), as well as the BizViz™ Manufacturing Intelligence/Business Visualization Suite (including the ReportWorX™ enterprise reporting/charting/analysis component).

Project Summary

The Republic of Croatia, in cooperation with The European Union, introduced legislation for environmental protection through continuous emissions monitoring. Dalmacijacement d.d. set out, with assistance from ECCOS inženjering, to bring all of its factories under compliance, with the goal of creating a continuous emissions monitoring system (CEMS). Manufacturing facilities are often assumed to be sources of pollution, so a system was required that could continuously monitor emissions, graphically depict these emissions, normalize the measurements, archive measured and calculated (i.e. normalized) values, inform the public through corporate Web pages and, most importantly, create daily, monthly and yearly reports in Microsoft Excel and XML-formats that adhere to the legislative requirements.

The newly created system collects raw (i.e. measured) values and recalculates them to create normalized data based on the normalization factors. Both raw and normalized values are presented to the operator through ICONICS GraphWorX in real time. If any of the measured values exceed the defined upper limits, an alarm is triggered via AlarmWorX, informing the operator to change the process in question. Any other malfunctions or errors in the equipment also trigger alarms, which are depicted in GraphWorX and stored to a database via AlarmWorX logger.

Data is stored to a SQL database through ICONICS'

TrendWorX. Since the project has to satisfy people in different positions with different interests, data is stored in three logging groups; 1 minute; 10 minute; and 30 minute average values. The first two groups are important to the operators at the factory (real time) and to the public through corporate Web pages (slight delay). The third group (30 minute average values) is needed to create reports for the Croatian environmental agency.

Reports are created through ICONICS' ReportWorX, a component of the BizViz suite. Considerable SQL programming (Stored procedures, Dynamic SQL) had to be done due to the fact that the measured values had to be positioned on exact positions in Excel sheets (48 half-hour values per day - if one is missing or corrupt, the Excel cell has to be empty) as well as verified (Kiln On/Off, Main generator On/Off, Transition period or normal operation mode).

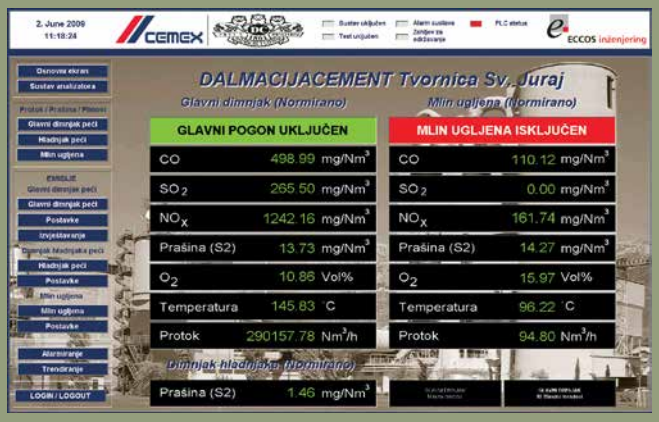
Benefits of the System

Dalmacijacement d.d. selected ICONICS for its emissions monitoring system upon ECCOS inženjering's recommendation. The ICONICS solution helped meet the building materials company's requirements for cost-effective data visualization, control, alarming, trending and reporting. The system integrates with the company's Siemens S7/300 modular controllers, SIMATIC ET200 I/O systems, Profibus communications and a number of specialized sensors including AirLoq gas analyzers, Flowsic 102 flow monitors, RM210/FW101 dust monitors and Itabar particle analyzers.

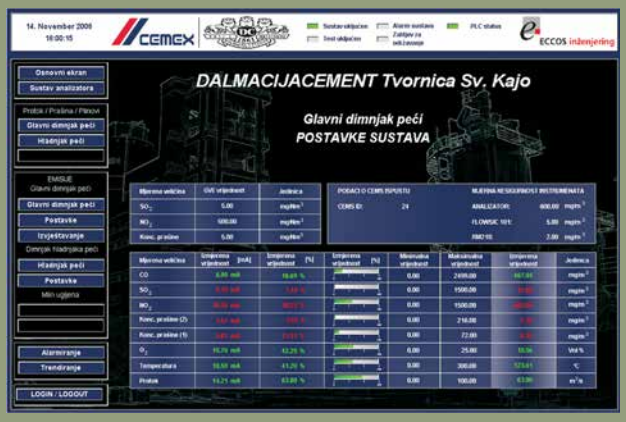
ICONICS solutions also integrate with Dalmacijacement d.d.'s Microsoft software, including Windows Server 2003 R2, Office 2007 (especially Excel) and SQL 2005 Express Edition SP2.

Conclusion

Dalmacijacement d.d. is pleased with their new driven emissions monitoring system and plans to use ICONICS for further development, addressing additional pollution factors throughout its sites, while ECCOS inženjering plans to use a similar system for other clients requiring the same level of emissions monitoring, including other factories, electric plants, waste processing facilities and more.



A Main Control Screen for Dalmacijacement d.d.'s Sveti Juraj, Croatia Plant



A Calculation Screen at Dalmacijacement d.d.'s Sveti Kajo, Croatia Plant

Solutions Highlighted

GraphWorX
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

TrendWorX
Data Logging Charting and Reporting Software

BizViz
Manufacturing Intelligence/Business Visualization Suite

A Dematic Warehouse

Dematic
Banbury, United Kingdom

Control Room in a Dematic Warehouse

> *"They really understand what we do and what we need. When I make a support call, it does not matter to whom I speak as they all know who we are, what we do and at what level to address our request. We never need to escalate a support request - we leave ICONICS to do that."*
>
> **Joe White**
> Dematic

About Dematic

Dematic Limited is a market leader in innovative logistics automation systems and solutions. With industry expertise acquired over decades, Dematic is committed to worldwide service. Dematic designs, develops and supplies a comprehensive portfolio of products for logistics systems including automatic storage and retrieval machines, conveying and sorting systems, order picking systems, voice technology and palletizing systems.

A key element of any Dematic solution is the ability to visualize the exact status of all parts of a system to ensure availability is high. Built on ICONICS' GENESIS technology, Dematic systems make use of powerful features to produce effective logistics solutions.

Dematic's warehouses can be extraordinarily large on account of retailers outsourcing their warehousing. When handling as many as 34,000 items or supplies to 700 retail stores, automation and visualization are key functions.

ICONICS Software Deployed

Dematic uses ICONICS' GENESIS32, enjoying the benefits of GraphWorX, AlarmWorX, TrendWorX and ReportWorX.

Key Features

With 30 installations across 25 warehouses in the UK alone, there are over 120 GENESIS systems installed in Dematic's network. Dematic's business is frequently based and measured on availability, or the capability of the logistics system to function. Dematic depends on the pan-and-zoom feature to navigate large high-resolution screens. Blockages in the warehouse require fast and accurate action, and

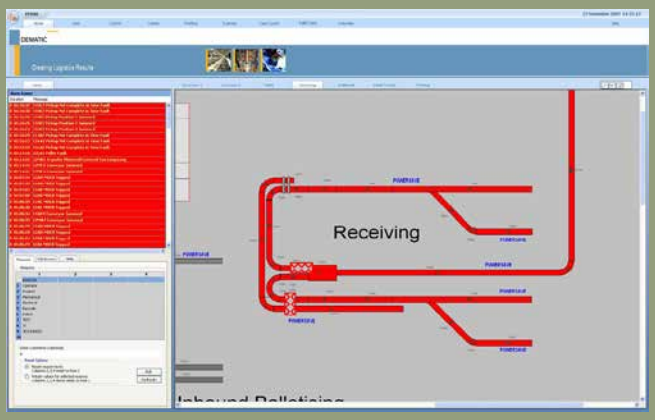
the pan-and-zoom feature of ICONICS' worldview is the best tool to solve the problem.

Project Summary

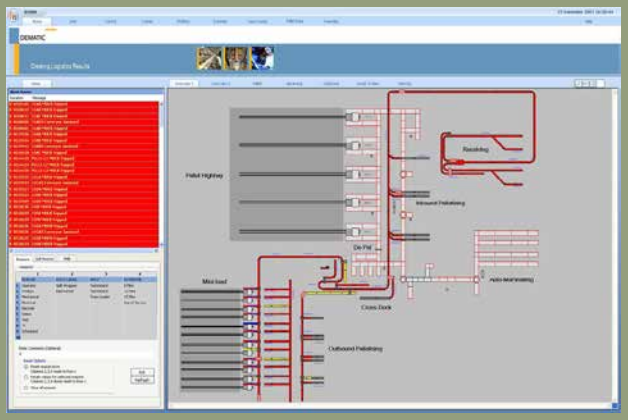
Looking at the Dematic worldview reveals a finely detailed spider web-like diagram of the warehouse's physical layout. Mechanical and electrical components are color coded according to their status. The warehouse supervisor can both pan and zoom with built-in GENESIS features to get accurate localized information and then dispatch a "jam-buster" or engineer by radio to investigate and solve the problem.

Benefits of the System

Dematic's use of GENESIS32 plays a significant role in the development of Dematic's business. The enhanced visualization that has been engineered provides a very tangible feature when Dematic is discussing new business. A customer can readily see what it would be like to run their new systems using the Dematic Visualization System.



Receiving Screen



Pallet Screen

ICONICS' symbol technology allows Dematic engineers to develop modular solutions within the visualization software. This has shown to deliver significant engineering savings when implemented on subsequent projects. Application quality is also inherently improved as the modules are thoroughly tested in development and repeatedly proven through use.

Dematic systems require alarms and events to be reported. Reporting is automated, but engineers on location of the event can input extra information using drop-down menus. This annotation is added to the alarm to provide root-cause information for later analysis. All data is captured allowing for continuous improvements to be made, and high warehouse availability to be sustained.

Conclusion

ICONICS is a major part of Dematic's future direction and capability. Warehouse visualization places heavy demands on a SCADA system and ICONICS is up to the challenge. Tight integration of visualization, alarming and reporting tools results in a solution that provides Dematic with high levels of availability through fast and accurate information processing from the automation level.

Dynastar's Sallanches, France Manufacturing Facilities

Dynastar
Sallanches, France

Ski Production at the Dynastar Sallanches, France Plant

> *"Dynastar benefits from development from ICONICS, which resulted in a simple and very powerful solution."*
>
> **Pierre-Marie Guillaud**
> Energy Management Rep.

About Dynastar

Since 1963, Dynastar, a division of the Rossignol Group located in Sallanches, France, has designed, manufactured and distributed a wide range of skis and skiing equipment for competition and the general public. Dynastar's birthplace, Mont-Blanc, provides an incredible laboratory to develop and test tomorrow's most technically innovative products. Chamonix is Dynastar's base camp, and its inspiration.

To drive its success, Dynastar works in consultation with athletes, using their valuable feedback to develop new equipment. At the 1992 Winter Olympic Games in Albertville, France, the brand had the highest number of winners, reaching a total tally of three gold, three silver and two bronze medals. Fifty-one years after its creation, Dynastar is one of the world leaders in the ski industry and the brand ranks among the most successful medal winners in history.

ICONICS Software Deployed

Dynastar, in coordination with their systems consultant, LANSARD of Pringy, France, selected ICONICS GENESIS64™ HMI/SCADA suite, including AlarmWorX64™ enterprise-wide alarm management system and WebHMI™ Web-based, real-time automation component. They also included ICONICS' BridgeWorX™ real-time workflow for data bridging and ReportWorX™ real-time reporting/charting/analytics tool.

Project Summary

Dynastar aimed to update the automation capabilities of its Sallanches location, a 28,000 square-meter facility producing over 300,000 skis per year. Its objectives for this project was to reduce energy consumption related to its manufacturing process, as well as implement a global visualization interface. The company wanted a system that could rationalize the use of production equipment as well as provide warnings of hardware failure. At the

time, the company was running Microsoft Windows Server 2008 R2 with multiple Web clients, as well as SQL Server, in addition to Excel, for its database needs. Its existing manufacturing system was comprised of TREND and Honeywell devices, in addition to hundreds of other tags, all of which required an easily integrated automation solution.

The French ski manufacturer required a supervisory product that could allow product managers to set, view and make use of real-time availability requirements of workshops and equipment.

based trend dashboards (via TrendWorX64 and GraphWorX64). Additional benefits to the company have been GENESIS64's ability to perform schedule management, to set user role profiles and to run usage reports, as well as:

- Better Management for Planning Production Facilities
- Improved Maintenance Team Response
- ROI within 4 Months
- Reduction of Nearly 11 Percent of Annual Energy Consumption

Main Screen at Dynastar Created with GENESIS64

A Dynastar Facility Management Control Display

Benefits of the System

Once Dynastar and LANSARD installed ICONICS GENESIS64, along with several other ICONICS software components, the system provided remote access to LANSARD for monitoring and maintenance of Dynastar's Sallanches facilities. ICONICS software is able to handle Dynastar's large amounts of data (generated from occupation workshops, manufacturing and other sources) and establish an energy consumption profile based on those parameters.

The ICONICS solution allows for the connection to, and communication with, multiple different devices over Ethernet via standard OPC and BACnet protocols. Dynastar appreciated its new automation system's 'unique' interface, with Web-

Conclusion

Dynastar, with assistance from LANSARD, sought automation software with a simple interface that could integrate with multiple brands of connected equipment. It needed to be a simple, fast and intuitive Web-based solution that would help save the company in energy costs and assist in the scheduling and maintenance of its workshops and manufacturing assets. For other vendors, such requests can cause too many bumps along the way. For ICONICS, this installation was as straightforward and smooth as Dynastar's skis.

Hydrovision Ltd.
Aberdeen, Scotland

A Hydrovision Ltd. ROV Model

ROV Model Monitoring and Control by Hydrovision

> *"Through many ROV implementations with the ICONICS GENESIS32 software over several years, it has proven to be a highly reliable, accurate and dependable system."*
>
> **Hydrovision Ltd.**

About Hydrovision Ltd.

Hydrovision Ltd. is the world leader in the manufacturing of Remotely Operated Vehicles (ROVs). Hydrovision is a private limited company located in the heart of the UK and specializes in the design and manufacturing of sub-sea robotic systems. These systems need to meet extremely demanding standards of performance, control and endurance for the Underwater Salvage, Cable Laying and Offshore Oil drilling industries that deploy these ROVs.

ICONICS Software Deployed

Hydrovision Ltd. selected ICONICS GENESIS™32 Software suite of SCADA and OPC products to meet their requirements for a new scalable control system for their ROVs, sub-sea tooling and other custom tooling applications. Their specifications required a PC-based system running under a Windows operating system and meeting open standards like OPC. AlarmWorX™32, TrendWorX™32 and GraphWorX™32 modules met all their needs.

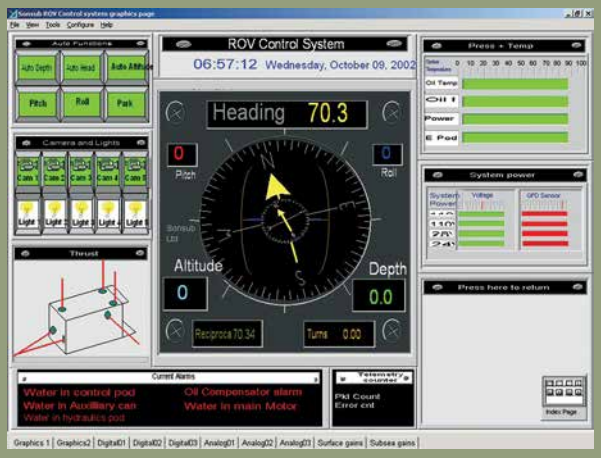
Key Features

The modularity of the GENESIS32 software allows the desired scalability of their complete control system on a scale of 4 to 1, which represents their largest machine to the simplest system configuration. The GENESIS32 software suite of applications operate seamlessly together, communicating solely via an OPC server which allows easy interface to any industry standard hardware and software systems. The software also has an intuitive development environment, which allows for speedy development and re-engineering by both experienced and new SCADA Engineers.

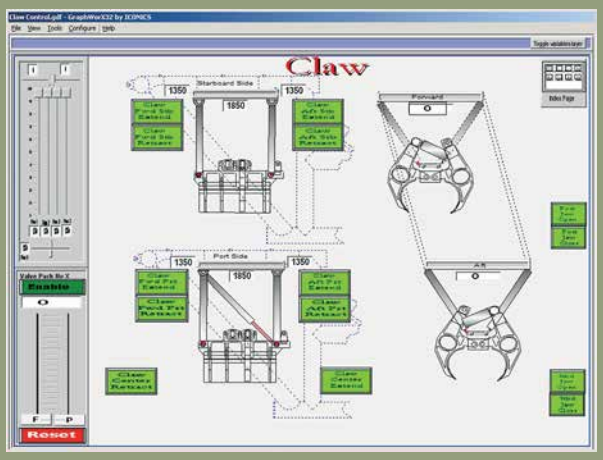
Project Summary

ICONICS GENESIS32's GraphWorX32 software was used to create the Operator Interface HMI screen using multiple touch screen control panels for control of the ROV machine with a single main display

to continuously present the system data. The sequential tasks that needed to be performed were created on separate individual HMI display screens, which are brought up to view using touch screen control buttons. Each sequential screen presents only the controls and feedback information required for each sequential task. This was achieved by creating a series of animated general assembly CAD drawings of the machine and sections of the tool to be controlled. Sensor feedback information from the tool was used to animate these drawings allowing the operator to continuously view the real time status of the tool and



Another Hydrovision ROV Control Screen



ROV Claw Control

of each sequential task. Backup video cameras are also fitted to the machine to assist the operators and to enable them to observe the tool's operation. As the operators progress through the display screens to control the tool's functions, using the touch screen buttons, they will carry out the complete machine process operation.

Benefits of the System

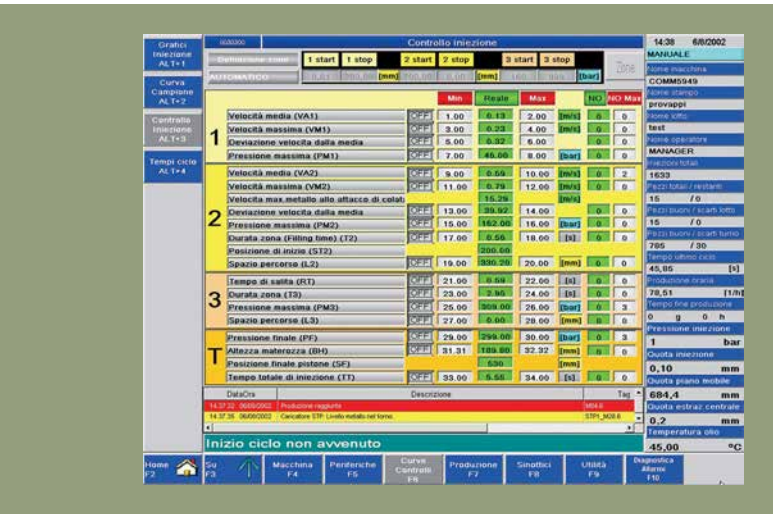
The experience Hydrovision Ltd. has had with the ICONICS GENESIS32 software suite of tools is that they have exceeded their goal of creating an ROV control system that is totally open in design, maintainable for the foreseeable future, scalable from their smallest designed machine up to the most complex machine, easy to modify after implementation on an original manufactured machine, and initially economical/proven to be on an ongoing basis. The software system is based on a hardware and software platform that will continue to evolve and be supported for many years to come. Also, the nature of the control system implemented with the ICONICS GENESIS32 software allows Hydrovision Ltd. to train their customers to make their own modifications to the machines, in the case of using different tooling or in different use applications.

Conclusion

ICONICS has worked closely with Hydrovision Ltd. to make this ROV Machine control project successful in every aspect. Hydrovision Ltd. participates in the ICONICS OEM Support and Maintenance program to keep its software updated and for access to technical support personnel as needed.

IDRA Presse S.p.A.
Brescia, Italy

IDRA Presse S.p.A. Plant
Brescia, Italy



Control Screen at IDRA Presse

> *"The ICONICS software system has significantly reduced development and implementation time and has allowed us to tailor the systems, very efficiently, to the customer needs."*
>
> **Dr. Davide Gardoni**
> Project Supervisor
> IDRA Presse

About IDRA Presse

IDRA Presse is a leading producer of Pressure Die Casting Machines. IDRA manufactures large (20 to 5000 Ton clamping force) metal die casting machines that are shipped to clients worldwide. The market focus for IDRA is in automotive, where their machines are used to cast engine blocks, car body frames and other automotive parts for clients such as Mercedes-Benz, Ford, GM, Chrysler, VW, BMW, Fiat and many others. They also have casting customers such as Black & Decker, Electrolux, Siemens and Singer. Over 80% of their sales are in Europe.

ICONICS Software Deployed

IDRA selected ICONICS to provide them with state-of-the-art injection press machine monitoring and control after evaluating nine other suppliers including Intellution, Wonderware, WinCC and RSView. IDRA replaced their existing Orsi Cube system with the GENESIS32™ HMI Software suite, which included GraphWorX™32, AlarmWorX™32, TrendWorX™32 and ScriptWorX™32 and installs this on each Pressure Diecasting Machine they deliver to their customers.

Key Features

IDRA has the requirement of sampling process parameters on their Pressure Die Casting Machines at 10,000 cycles/sec and needed a software system to have the ability to collect real time data at those rates. They use an external sampling system with real time operating software. This system is connected through an Ethernet link with ICONICS software using an OPC Server on a PC, where TrendWorX32 trends the data collected. This data is then sent via a LAN to a centralized database for final evaluation and storage.

Project Summary

ICONICS GENESIS32 software has been deployed to provide supervision and operator visualization to the metal injection press machine operations. The operator has the ability to set the machine parameters to display critical real time information about the process. All the real time injection data from the press machine is collected and stored in a relational database. All collected data is available in a graphical display that also includes third party ActiveX's data.

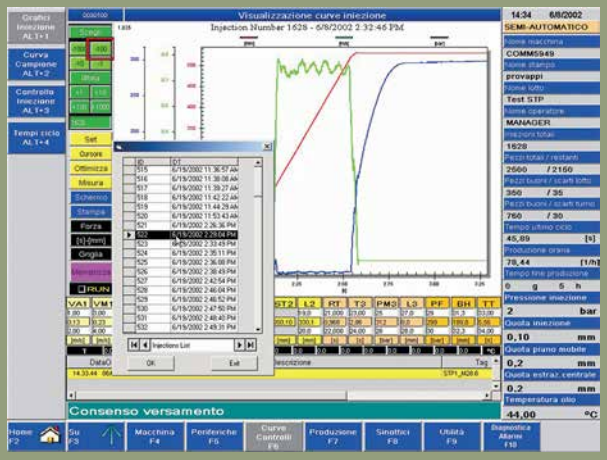
IDRA also uses ICONICS TrendWorX32 to display and store process data. Each press machine is equipped with dual network interface cards, one for communicating collected real time data over their LAN to be stored into their database. The second network interface is used by the end customer to provide them with access to all the stored data on that press machine through an ODBC driver. A modem is also installed on the press machine for remote diagnostics and/or update modifications from IDRA. The press machine system interfaces with up to 4 Siemens PLCs, 1 Allen-Bradley PLC and has over 500 I/O points with 300 Tags. The complete installation was completed by IDRA over the course of 18 months.

Benefits of the System

Collected press machine data is stored in a Sybase database. The use of ICONICS software default libraries has made it possible for IDRA to develop special login/logout software personalized to each user. They were also able to develop DLL library ActiveX, which provides a graphical interface for injection line visualization, PLC interface and navigation buttons used in runtime mode. ICONICS enables IDRA to easily address the customization requirements of their customers. With ICONICS software being extremely flexible, it is possible to change the control systems of a press machine under software control by up to 30% very easily without impacting original delivery schedules. Giving the customer access to the collected press machine data as the systems are built is a valuable selling tool for IDRA. The ease of use inherent to ICONICS software, the cut and paste tag name feature, and the modularity of configuring alarm screens using AlarmWorX32, makes system implementation extremely easy and quick to develop.

Conclusion

ICONICS has worked closely with IDRA to make their Metal Injection Press Machine project successful in every aspect.

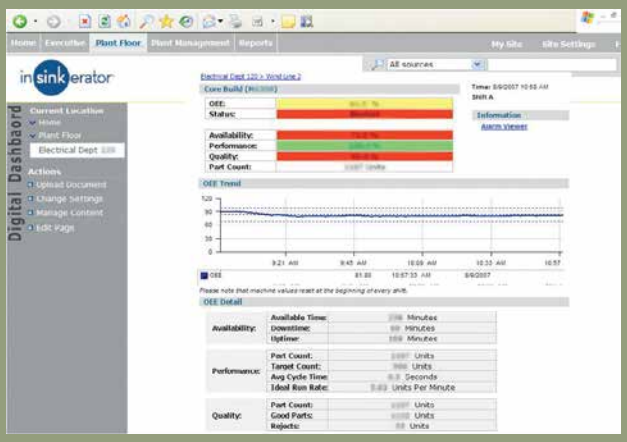


Presse Trend Data Display at IDRA Presse

Presse Statistical Data

InSinkErator®
Racine, Wisconsin

The InSinkErator Evolution Excel® Features Cutting Edge Grind and Sound Technology



The InSinkErator Business Score Card Concept

About InSinkErator

InSinkErator, a division of Emerson Electric Co., is the world's largest manufacturer of food waste disposers and instant hot water dispensers. The InSinkErator Evolution Series® disposers showcase new technologies including an improved grinding ability and up to 60% noise reduction. Technological advancements also abound on the InSinkErator plant floor in Racine, Wisconsin, where ICONICS solutions have been implemented to improve productivity.

ICONICS Software Deployed

InSinkErator selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite including GraphWorX™32, TrendWorX™, AlarmWorX™32 and DataWorX™32. For manufacturing intelligence and business visualization, InSinkErator chose the BizViz Suite, including PortalWorX™, ReportWorX™ and BridgeWorX™.

Project Summary

As part of their continuous improvement efforts, InSinkErator was looking for a way to increase their productivity and efficiency. InSinkErator decided to improve efficiency within their existing buildings. InSinkErator identified the need to provide management with visualization of manufacturing problem areas.

By closely monitoring and analyzing overall equipment effectiveness (OEE) and Key Performance Indicators (KPI), InSinkErator could implement improvements to its production processes. InSinkErator, with the help of ICONICS, formulated a digital dashboard to achieve operational excellence within their production facilities.

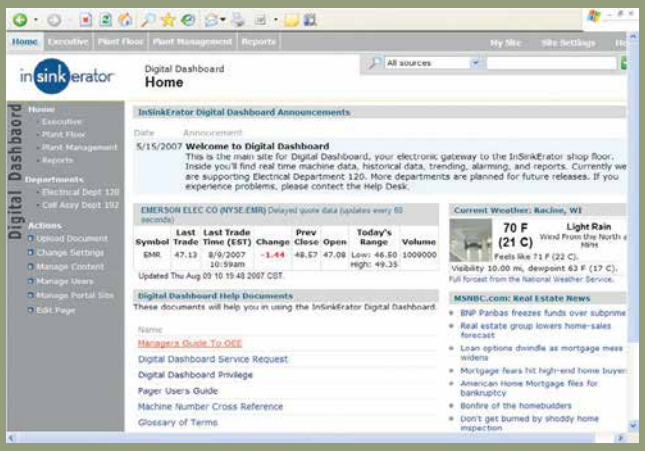
From supervisors on the plant floor to the VP of Operations, the InSinkErator ICONICS-powered Web-enabled dashboard caters to a diverse range of technical backgrounds. In an accessible portal, users find interactive features such as a stock-ticker, weather reports and real estate news. Easy-to-use buttons provide access to help documents including a manager's guide to OEE, a glossary of terms and a user's manual.

Benefits of the System

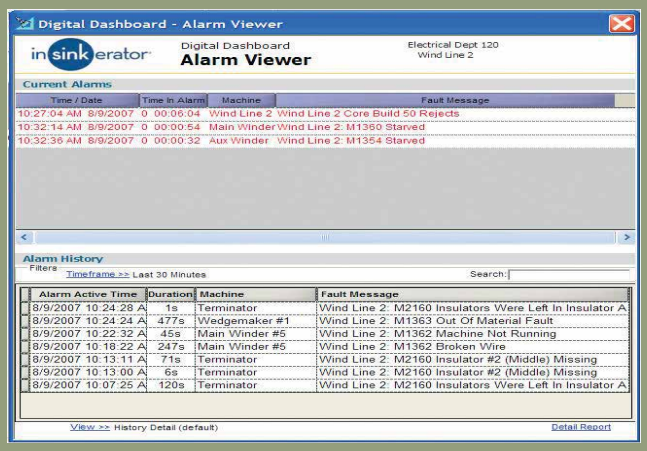
The ICONICS GENESIS32 Software System helps InSinkErator efficiently gather and visualize production data. Users can drill down to machine views and gather details on OEE, including availability, performance and quality metrics. The InSinkErator alarm viewer features easy access to current and historical alarms, worst performer views and adjustable time frames. With email and alerts for critical alarms, InSinkErator can react in real time to reduce downtime. Users are able to use reports flexibly, as they tweak and filter data to their specifications in the familiar format of Microsoft Excel.

Measuring and analyzing manufacturing methods with ICONICS solutions, InSinkErator can implement improvements to increase productivity. With plans to add 71 machines to the ICONICS system in the future, InSinkErator will experience an even wider view of their operations, and remain on the cutting edge of the food & waste disposal market.

Visit InSinkErator at www.insinkerator.com.



The InSinkErator Interactive Portal, Complete with Real Estate News and Weather



The InSinkErator Alarm Viewer

Conclusion

Using a Six Sigma DMAIC process, InSinkErator defined its problem of capacity strain and identified its need for improving productivity. Using an ICONICS digital dashboard, InSinkErator was able to measure productivity and reveal process problems. Data was then analyzed by teams, who identified exactly what changes needed to be made. Finally, InSinkErator looked back to their ICONICS digital dashboard to verify that these improvements had been realized.

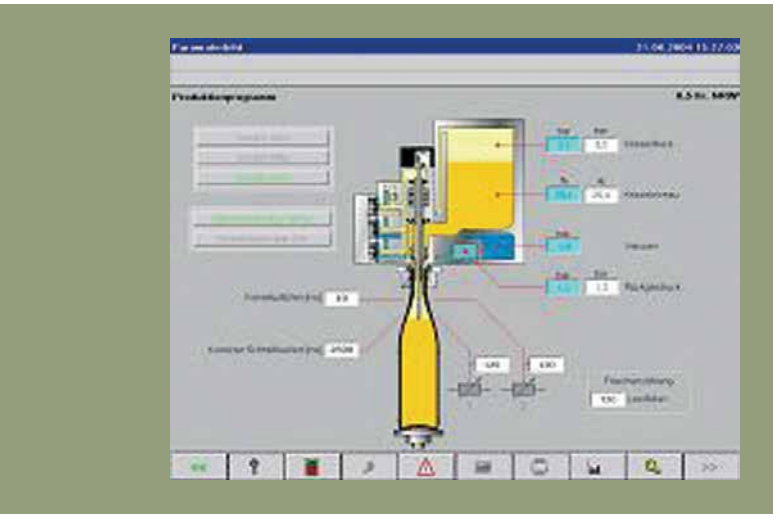
Case Study Details

Some statistics and details on the InSinkErator solution from ICONICS:

- A Matrikon OPC server provides connectivity
- 20 graphical displays
- 91 pieces of manufacturing equipment
- InSinkErator uses a unique business score card concept for assessing machine performance
- Red, yellow and green colors indicate the status of machine performance, offering users a quick visual method of analysis

KHS Maschinen
Dortmund, Germany

Aseptic Cold Filling at a KHS Maschinen Beverage Industry Customer



KHS Parameter Display Screen

About KHS Maschinen

KHS, with headquarters in Dortmund, Germany, is a market leader in the deployment of ACF (Aseptic Cold Filling) applications for the beverage market. KHS offers the highest level of competence as an international full-service provider in planning, deploying and maintaining filling and packaging applications for the food and beverage industries. In 2003, KHS generated revenue of 700 million Euros with 3,200 employees around the world.

Eckes-Granini Deutschland GmbH is a market leader in Europe in the fruit juice market. At its facilities in Bad Fallingbostel, Germany, Eckes-Granini successfully deployed an innovative aseptic cold filling application by KHS. Specialty fruit juices are microbiologically sensitive and perishable when exposed. The ACF (Aseptic Cold Filling) process allows for fruit juices to be filled into PET bottles at a temperature of only 68 Deg F (20°C). The main advantage with the ACF process is that KHS completely eliminated the need for preservatives, thus improving product quality.

ICONICS Software Deployed

KHS standardized on GENESIS32™ to control its applications and machines and to visualize the entire ACF process. The GENESIS32 Software Suite is able to meet KHS' sophisticated needs for scalability, graphic capabilities and modularity for machine control and visualization. GENESIS32 communicates via OPC and Profibus to a Siemens S7 PLC and I/O running on the Microsoft Windows 2000 operating system. GENESIS32, as a modular suite of products, allows KHS to use only the components they need. It is easy to add modules, as the complexity and requirements of the process change.

All ICONICS client software modules are based on OPC technology, which makes it easy to communicate and interact with other automation hardware and software products.

Project Summary

GENESIS32 also offers an excellent international language switching technology. Graphic symbols, as well as trend and alarm applications, can be created once and reused all over the world, resulting in tremendous savings in areas of applications engineering and support.

Key Features

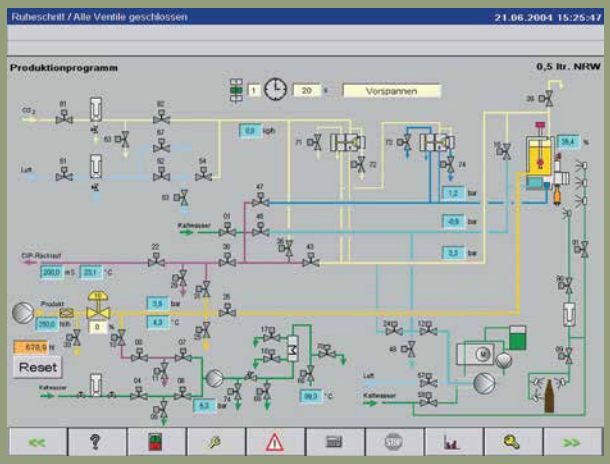
Another major advantage of GENESIS32 is its integration in today's IT environments. Using GenBroker™, OPC and SOAP/XML communications technology makes it easy to connect and visualize processes in existing IT structures. Also, accessing enterprise-wide databases is essential when analyzing historical production and business data.

KHS appreciates the intuitive configuration environment of GENESIS32. GraphWorX32 allows for the easy creation of animated 3D graphics to visualize process applications. The Symbol Library provides the application engineers with often-used symbols, and also allows users to save custom symbols with all dynamic and language-specific connections for later use.

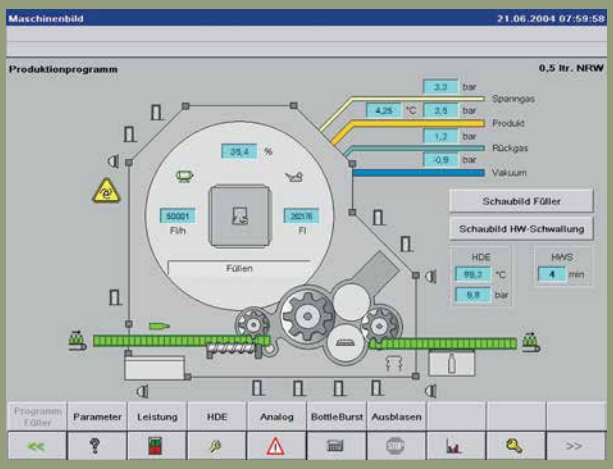
The ICONICS Security Server provides a built-in security architecture that supports FDA 21 CFR Part 11 requirements. Audit trails and multi-level password protection are built into the Security Server. Therefore, all operator interaction (who, where, when and what) is documented and stored in a database.

Conclusion

KHS' high expectations in its ACF application and GENESIS32 software have been met. Both KHS and ICONICS provided innovative solutions in their respective fields, resulting in a major contribution to the quality of Eckes-Granini fruit juice products.



Process Display at KHS Maschinen



Production Management Screen

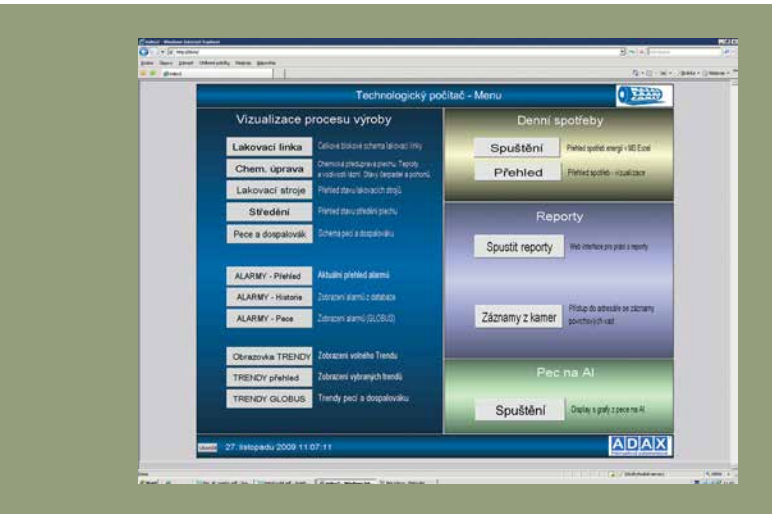
Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

GraphWorX
HMI Graphical Display Package

Metal Trade Comax a.s.
Velvary, Czech Republic

View of the Coating Line



Main Menu at Metal Trade Comax

About Metal Trade Comax a.s.

Metal Trade Comax a.s., located about 30 kilometers from Prague in the Czech Republic, is a producer of non-ferrous casting alloys and surface treated metal sheets and bands. Using coil coating technology, Metal Trade Comax applies organic coatings and embossing to aluminum, aluminum alloys, cold rolled steel and hot dip galvanized steel.

Coated metals have a wide breadth of functions, for both interior and exterior needs. Roofing, sheet metal, parapets, interior facings, windows, automobile superstructures, trailers, cladding of buildings, cold storage and swimming pools can be constructed of coated metal.

"ICONICS has been a very powerful and effective solution for Metal Trade Comax's data mining and data aggregation needs."

Petr Hornof
Programming Engineer,
ADAX s.r.o.

ICONICS Software Deployed

ICONICS GENESIS32™ with GraphWorX™32 provides visualization for all parts of Metal Trade Comax's coating line, where metal strips are painted or treated depending on their function. WebHMI enables remote Internet connectivity. ReportWorX™32 and TrendWorX™32 work together as the data logging, charting, reporting and analysis system, while AlarmWorX™32 delivers alarm information.

ICONICS software exchanges production data with Microsoft Dynamics NAV Enterprise Resource Planning software, for the complete integration of Metal Trade Comax's data and processes.

Project Summary

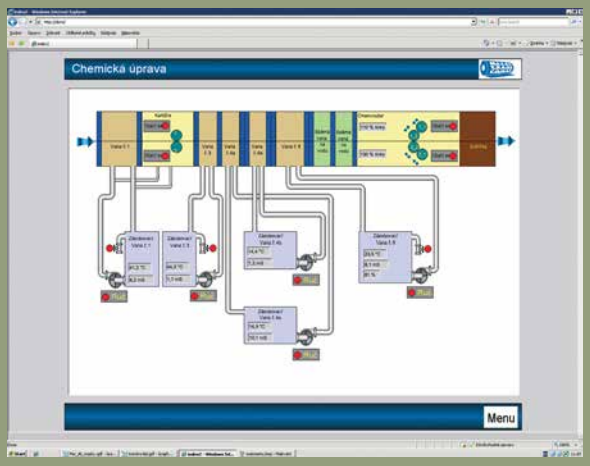
System Integrator ADAX s.r.o. implemented GENESIS32 for Metal Trade Comax after several successful projects in the Czech Republic. Following an 8 month implementation cycle, Metal Trade Comax enjoys a complete monitoring and control solution from ICONICS for their production processes.

ICONICS' open communication standards have helped Metal Trade Comax to gain interoperability with their devices from different vendors. ICONICS interfaces with a Siemens SIMOTION PLC, which controls the main drives or motors of the production line, and a Siemens Simatic S7-300, connected with industrial ethernet.

DataWorX32 provides OPC Data Aggregation from various OPC sources. Monitoring is enhanced with SNMP communication to devices for measuring energy consumption with variables including gas, water and electricity.

Benefits of the System

ICONICS enables an advanced process for ensuring the coated metal exits the production line without defects. Metal Trade Comax has a system in place to automatically evaluate surface defect in coils. Three fast industrial cameras are installed on the line, which can detect surface defects on the metal plates. Camera results are reported through ReportWorX, where data is visualized and saved to the server.



Chemical Treatment View

Coating View

Through TrendWorX, Metal Trade Comax is able to save large volumes of trend data from their production to a Microsoft SQL 2005 Server.

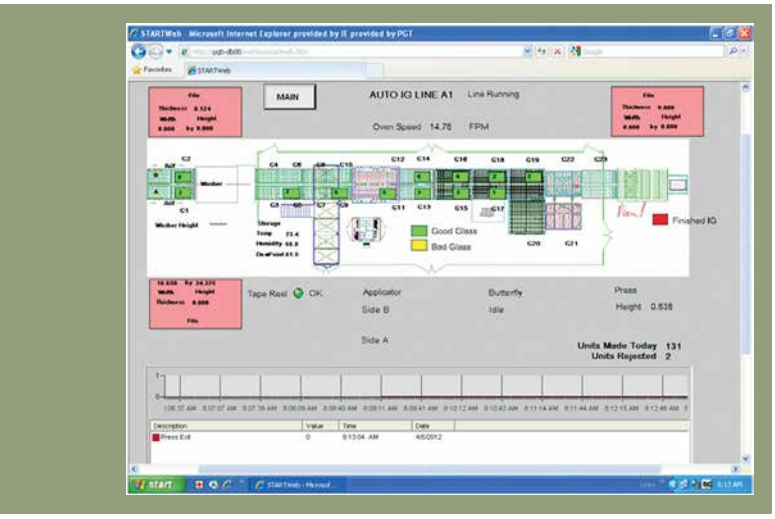
ReportWorX provides Metal Trade Comax with "Technological Reports" and "Customer Reports." Technological reports include information about conditions and events during production, such as defects on the surface of the strip coil or alarms triggered during the coating of the strip coil. Customer reports contain business information from Microsoft Dynamics NAV and a short description of the product including strip length, weight, material, and laboratory results.

Conclusion

With a successful ICONICS implementation running on the production line, ADAX programmers are working on the extension of Metal Trade Comax's existing system. Programmers are developing a SCADA system for Metal Trade Comax's 12 ton aluminum furnace. Metal Trade Comax will see further enhancements to their productivity.

Glass Impact Testing at PGT's North Venice Production Facility

PGT Industries
North Venice, Florida



A Control Screen for PGT Insulated Glass Assembly

> *"ICONICS Productivity Analytics, in addition to identifying issues, has been used to drive a cultural change in the company […] This system has been a great success and the production capacity found to exist in the current plants has exceeded any expectation."*
>
> **Jon McArthur**
> Manufacturing Technology Engineer
> PGT Industries

About PGT Industries

PGT® (pgtindustries.com) pioneered the U.S. impact-resistant window and door industry and today is the nation's leading manufacturer and supplier of residential impact-resistant windows and doors. PGT is also one of the largest window and door manufacturers in the United States. Founded in 1980, the company employs over 1,000 at its manufacturing, glass laminating and tempering plants, and delivery fleet facilities in Florida.

Sold through a network of over 1,300 independent distributors, the company's total line of custom windows and doors is now available throughout the eastern United States, the Gulf Coast and in a growing international market, including the Caribbean, South America and Australia. PGT's product line includes PGT Aluminum and Vinyl Windows and Doors; WinGuard® Impact-Resistant Windows and Doors; PGT Architectural Systems; and EzeBreeze® Sliding Panels. PGT Industries is a wholly owned subsidiary of PGT, Inc. (NASDAQ: PGTI).

ICONICS Software Deployed

PGT Industries selected ICONICS Productivity Analytics visual OEE/KPI/analysis software as their manufacturing intelligence system and GENESIS32™ HMI/SCADA software suite (including AlarmWorX32™ Multimedia alarm management, WebHMI™ Web-based real-time automation, and ScriptWorX™ 2010 creation/management of Visual Basic for Applications [VBA] scripts) as their system to integrate all their automation equipment. The manufacturer also chose BridgeWorX™ real-time workflow for data bridging and ReportWorX™ enterprise reporting/chart-

ing/analysis, as well as BACnet Connector, OPC Data Mining, Unified Data Manager and Unified Web Interface technologies.

Project Summary

PGT Industries runs its glass manufacturing operations from its North Venice, Florida plant. A few years ago, the company projected that demand would soon exceed production capacity and, as a result, constrain revenue growth. In response, they developed a capital plan with the intent to expand their manufacturing operations. However, prior to executing the capital expansion, the Vice President of Operations decided to test the assumptions about current capacity by installing and applying a productivity analysis tool.

ICONICS Productivity Analytics software was applied to the 12 most critical production assets to analyze the Overall Equipment Effectiveness (OEE) of the current plant. The software's drilldown and correlation capabilities were used to zero in on sources of loss of OEE, focusing on three OEE factors: availability, quality and performance. Prior to installation of the software and the analysis performed, most inefficiencies were reported as equipment capacity problems. Once the data analysis tools were online, numerous immediate issues were visible to all levels of the organization. These included production start-up meetings greatly exceeding allocated time, sporadic loading cart availability, improper material layouts causing gaps on conveyors to furnaces, and unplanned idle time.

Once these issues were uncovered with the assistance of Productivity Analytics, PGT created work teams to swiftly remedy the causes of downtime and production gaps. Productivity Analytics continues to deliver real-time, accurate data to the plant operators and upward through the organization. Any deviation from the ideal production rates is seen immediately. Any occurrence of downtime that exceeds a certain limit is immediately made known throughout the company so that all available help is quickly redirected to the issue.

PGT had considered other companies' offerings but ultimately decided on ICONICS, due to it "having all the needed tools and, most importantly, its ease of configuration". PGT's manufacturing technology team was able to quickly understand and configure the software and get a system online. Competitor products were deemed just too complicated.

Integrations

A critical need of the system was the ability to integrate data from many existing equipment systems,

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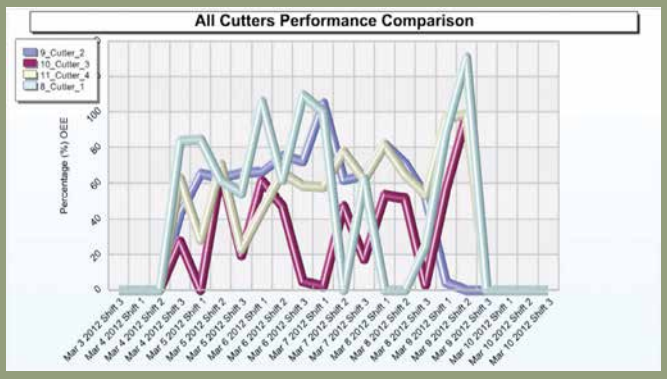
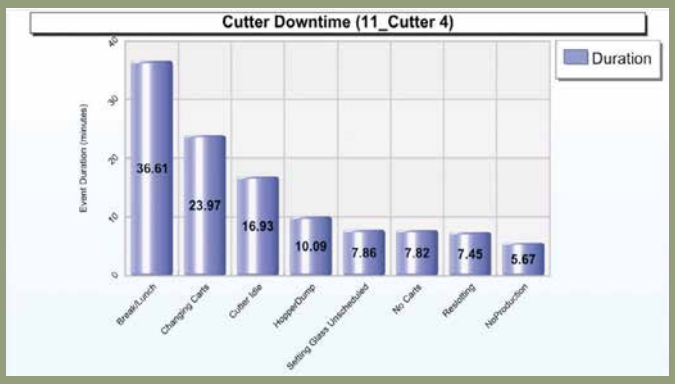


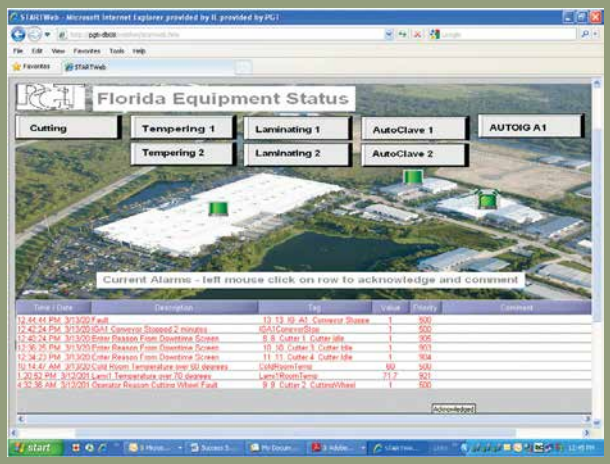
Performance Comparison of Glass Cutters



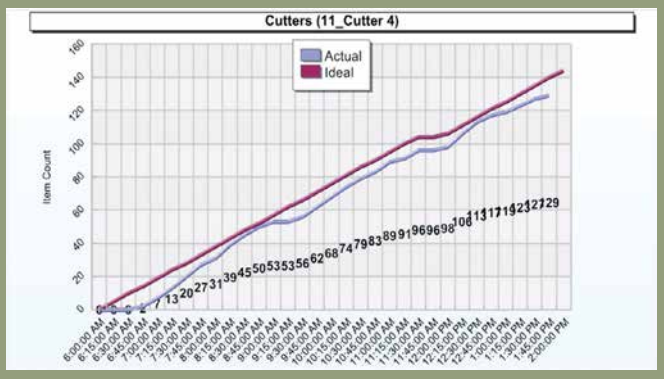
Productivity Analytics Allows for Auditing at the Corporate Levels

so that all interrelated issues could be seen and analyzed. The ICONICS system, including Productivity Analytics, integrates with the following equipment and data:

- Think and Do Live PC Control – On Glass Tempering Ovens
- Allen-Bradley MicroLogiX – Glass Laminating System
- ASCII Text Files, Read On Schedule – Eastman Laminate Cutters
- Rockwell RSView32 – Insulated Glass Assembly
- Bechoff Twincat – Insulated Glass Assembly



A PGT Web-based Portal, Integrated with ICONICS GENESIS32™, Showing Current Alarms



ICONICS Productivity Analytics Showing a Real-time Shift View at PGT

- Microsoft SQL (Many Databases) –Glass Cutters
- Moxa PLC – Insulated Glass Assembly
- CTC PLCs – Colonial Grid Production

Benefits of the System

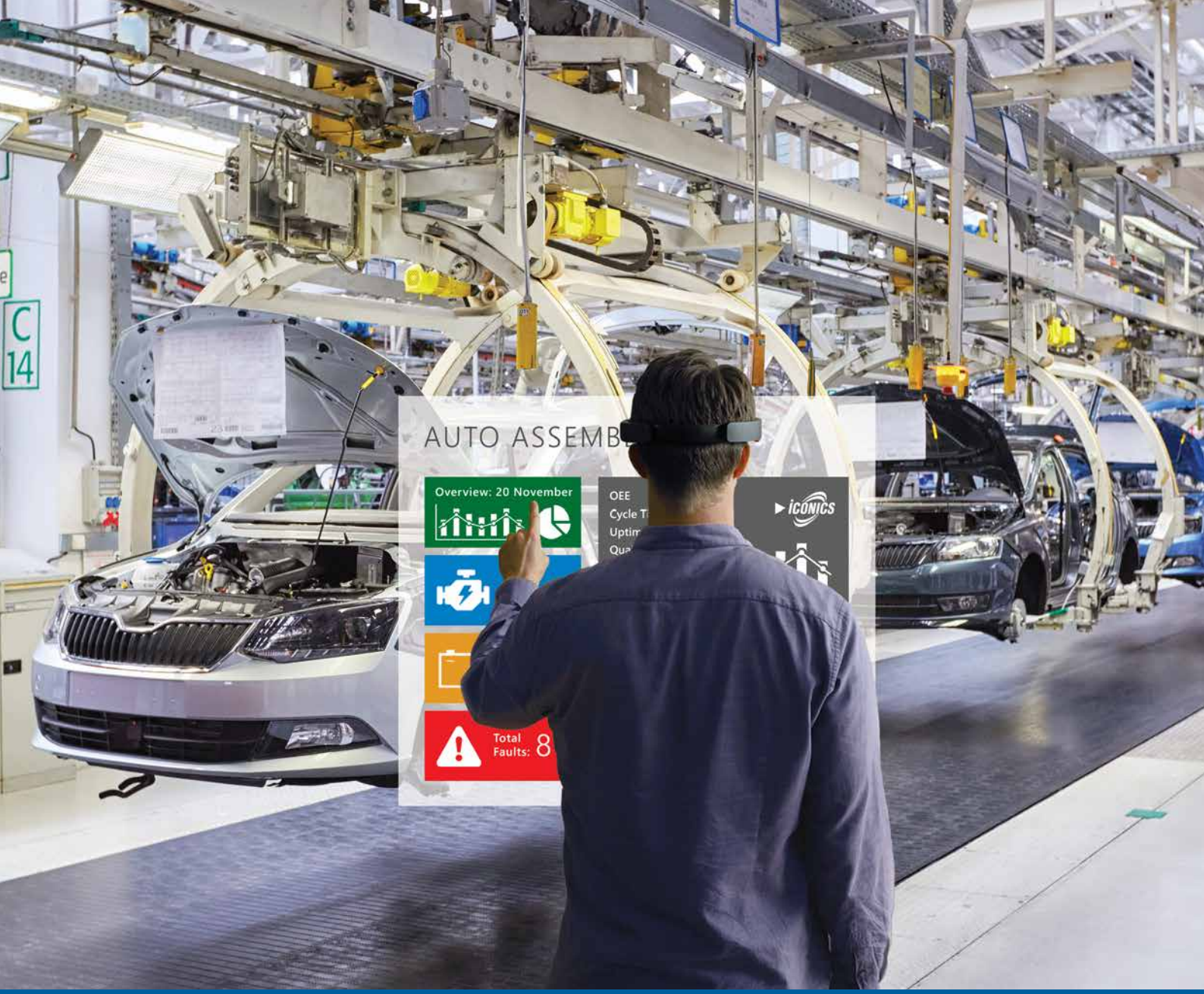
Now that PGT has initiated its OEE program, including the implementation of Productivity Analytics throughout all processes, the necessary data is continuously reported, in real time, to all levels of management. Over the course of a year, improvements were identified and implemented that resulted in an increase in production output using current assets. The planned plant expansion has been canceled, resulting in major savings for the company.

In addition, after the resulting improvement programs were implemented (as identified with Productivity Analytics), the plant has achieved improved production rates, running only five days a week instead of seven to meet current demand. This resulted in an approximate 20 percent decrease in labor and energy cost.

Productivity Analytics, in addition to identifying issues, has been used to drive a cultural change in the company. OEE and Downtime charts are now viewed by each line supervisor and by all levels of management. OEE is a subject discussed in almost all operations meetings and is included in all objectives. This system has been a great success and the production capacity found to exist in the current plants has exceeded any expectation. PGT has now commissioned the expansion of the Productivity Analytics implementation from the initial 12 assets to approximately 80 assets over three years.

Conclusion

Productivity Analytics helped provide transparency of undiscovered losses of production capacity. It is now being used as the source of benchmarking and performance measurement to drive a culture built around Overall Operational Effectiveness. With ICONICS software solutions, PGT's operations now run as smooth as the glass they produce.



Make the Invisible Visible

With the most advanced 2D and 3D HMI/SCADA technology, ICONICS introduces its Holographic Machine Interface (HMI), enabling users to make the invisible visible and experience a new dimension in augmented reality for manufacturing.

Want to learn more?

Visit www.iconics.com.

ICONICS
Make the Invisible Visible™

VISUALIZE | HISTORIZE | MOBILIZE | ANALYZE | CLOUD IoT

Celebrating 30 Years of Automation Software

PRAKAB a.s.
Prague, Czech Republic

Prakab a.s. Factory
Prague, Czech Republic

Main Control Screen at PRAKAB a.s.

About PRAKAB a.s.

PRAKAB a.s. is one of the largest producers of wires and cables in the Czech Republic, manufacturing power and communication cables as well as building wiring. An extensive investment program was recently launched to modernize the plant and increase production.

Over the last few years, PRAKAB has put new cable production lines into operation, in cooperation with systems integrator, ADAX, Ltd. This was in addition to the reconstruction and maintenance of management systems for existing production lines. ADAX staff was also involved in machine assembly and management systems supply.

ICONICS Software Deployed

ADAX has extensive experience with ICONICS products and therefore recommended the GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite to manage their customer's production lines. GENESIS32 Enterprise Edition is now tied to each production line, while GraphWorX™32 now appears on each of PRAKAB's application displays, helping to provide facility-wide status and details on individual machines. AlarmWorX™32 provides early warning to operators if set process parameters are exceeded and, in the event of any process failure, the software helps operators to determine a root cause. TrendWorX™32 assists in analysis of production quality.

PRAKAB also utilizes GENESIS32's recipe capabilities, designed to integrate with VBA. Reports are conveniently stored in Microsoft Excel files and SQL databases. The company uses DataWorX™32 software for OPC data aggregation, bridging, redundancy and tunneling.

Project Summary

PRAKAB's manufacturing processes involve multiple machines, including extruders, decoilers/unwinders, rewinders, heating/cooling devices and PVC granulate dosers. An average of 300 I/O points are incorporated into each of PRAKAB's 15 cable and wire manufacturing lines.

The company mainly uses Siemens S7-300 PLCs that provide data to the SCADA system over PROFIBUS and Ethernet networks via OPC communication standards. In addition to Excel spreadsheet, SQL Server and Access database management applications, PRAKAB also uses multiple Microsoft operating systems throughout its enterprise, including Windows Vista, Windows XP and Windows 2000.

System Benefits

PRAKAB is pleased with the updated system that ADAX helped provide for the management of its cable production lines. GENESIS32 HMI/SCADA was selected due to its modularity, ease of configuration, and adaptability to different types of production lines. PRAKAB and ADAX have also found how these characteristics make it possible to significantly shorten implementation time and reduce the total cost of the entire solution.

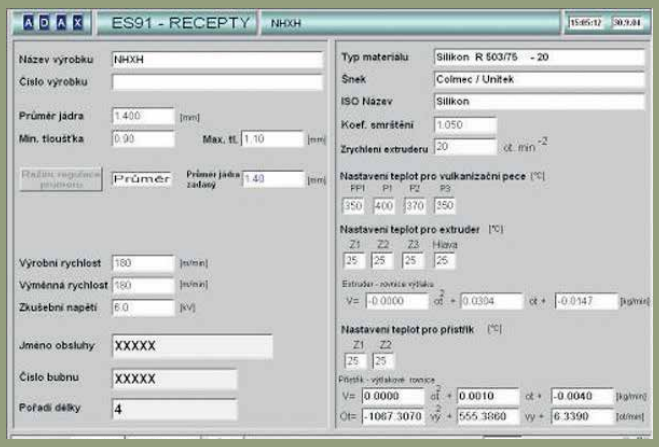
The new control system has increased the reliability of connected equipment as well as reduced production downtime. The appearance of unified operator panels on all production lines has reduced staff training time. GENESIS32's trending and reporting abilities makes it possible to maintain high product quality and to quickly analyze any possible problems. PRAKAB sees an advantage to DataWorX32's ability to set individual tag scan/read times, making optimum use of PLC communications and OPC technology.

Conclusion

ADAX has currently outfitted 12 of 15 of PRAKAB's cable and wire production lines with its updated management/control system, including GENESIS32, with more to come. Since ADAX, itself, recommends the entire range of ICONICS industrial automation software, PRAKAB has made plans for future system upgrades.

These include ICONICS' WebHMI™ plug-ins providing HMI/SCADA information throughout the company over the Web, as well as ReportWorX™ (part of ICONICS' BizViz™ Manufacturing Intelligence/Business Visualization suite) for data reporting, charting and analysis. With these plans, PRAKAB is taking steps to integrate the data it now receives from its upgraded production line management system into a more comprehensive corporate information system.

A Cable Line Extruder



A Recipe Display Screen for PRAKAB a.s. in Prague, Czech Republic

Solutions Highlighted

GraphWorX32
HMI Graphical Display Package

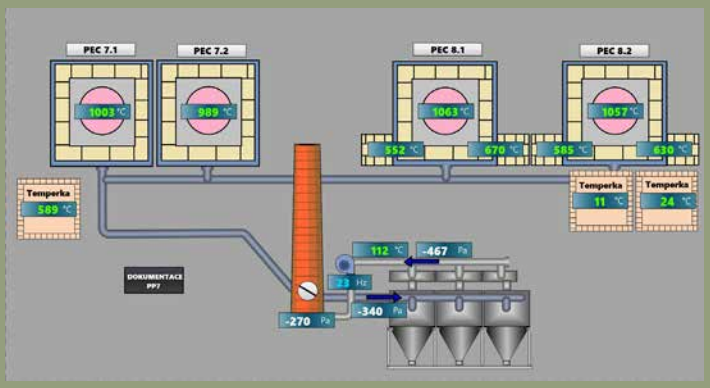
AlarmWorX
Multimedia OPC Alarm Management Software

TrendWorX
Data Logging, Charting and Reporting Software

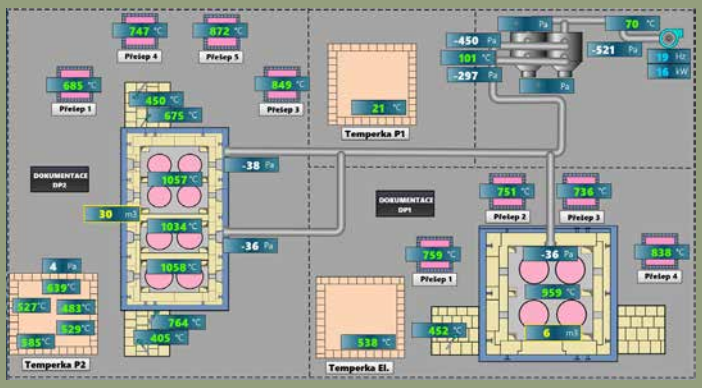
DataWorX32
OPC Data Aggregation, Bridging, Redundancy and Tunneling

Preciosa Ornela Factory in Desna, Czech Republic

Preciosa Ornela, a.s.
Desna, Czech Republic



Temperature Monitoring/Control via GENESIS64™



Process Monitoring/Control at Preciosa Ornela, a.s.

About Preciosa Ornela, a.s.

Preciosa Ornela, a.s. (www.preciosa-ornela.com), a division of the Preciosa Group, located in Desna, Czech Republic, is primarily involved with metallurgical production, glassmaking and the manufacturing of raw materials for jewelry. The company describes itself as one of the largest specialized glass companies in the world as well as one of the world's most significant producers of a wide range of glass products made from glass rods and lampworking rods, technical and utility glass and all types of glass seed beads and beads.

ICONICS Software Deployed

Preciosa Ornela selected ICONICS' GENESIS64™ HMI/SCADA suite, including WebHMI™ web-based real-time automation software.

> *"Preciosa Ornela chose ICONICS' GENESIS64™ due to its fast, user-friendly configuration, as well as for the opportunity to create user interfaces for all levels of our staff."*
>
> **Pavel Beran**
> Preciosa Ornela, a.s.

Project Summary

Preciosa Ornela required an update to their existing

32-bit HMI/SCADA software involved with the monitoring of temperatures, electrical parameters and combustion ratio glass sets as part of their production processes. The company was happy with its existing GENESIS32 installation but wanted to add the multiple modern features included in newer 64-bit software.

After evaluating offerings from multiple vendors, Preciosa Ornela decided to remain an ICONICS customer and chose GENESIS64, which, along with GENESIS32, provides real-time monitoring of their continuous production process. The long-term, multi-day process requires extreme precision and control to ensure that all ingredients are introduced at just the right temperature and at just the right time. GENESIS64 provides real-time production process visualization, trending, and alarming, along with integrated batch control, to operators and other key stakeholders.

The manufacturer currently uses GENESIS64 to monitor and control 4,000 individual assets, including 3,500 I/O points, in addition to connecting to multiple PLCs and Omron and Eurotherm regulators. The system was able to seamlessly integrate with existing Modbus, OPC and TCP/IP communications, as well as with the company's existing Microsoft SQL Server installation for archiving. Preciosa Ornela opted for ten local supervisor stations running ICONICS WebHMI for web-based visualization, monitoring and control.

Benefits of the System

Preciosa Ornela chose to remain with ICONICS and add GENESIS64 due to the performance of their existing GENESIS32 solution, the multiple abilities within the user interfaces and price of the solution. Through GENESIS64 and WebHMI, the company is able to monitor and control intricate production processes via web browsers in multiple locations throughout their factory.

Conclusion

Preciosa Ornela is happy with its new addition of GENESIS64 and plans to eventually transition to the 64-bit solution completely, as well as potentially include the data analysis capabilities of ICONICS' AnalytiX® suite, all sure to provide the glass manufacturer with a clear view of its valuable data.

A Preciosa Ornela, a.s. Facility

Metal and Glass Manufacturing

SAP Research
Future Factory Initiative
Dresden, Germany

Future Factory Initiative Lab
Dresden, Germany

ICONICS 3D Rendering of the Future Factory Lab

> *"ICONICS is one of the best of the breed that I have seen in visualization."*
>
> **Dr. Jochen Rode**
> P.h.D., Project Lead
> SAP Research, CEC Dresden, SAP AG

About The Future Factory Initiative

The Future Factory Initiative (FFI) is a joint effort of SAP Research and external partner organizations, including ICONICS, and is active in key areas including a Living Lab, a Real-World Manufacturing Testbed and a Center of Excellence.

Located in SAP Research's Dresden, Germany Campus-based Education Center (CEC), the Future Factory Initiative is a set of innovative demonstrators showing the potential of real-world-integrated business processes in the manufacturing domain. Currently six demonstrations are available covering the whole product value chain, including supply chain, warehouse, production, sales and maintenance processes. The "Future Factory" has recently been showcased at various locations and events, such as at recent CeBIT shows.

According to SAP's Web site, the Future Factory Lab in Dresden "facilitates research and development in a living lab environment, providing an infrastructure for test, validation, and demonstration".

ICONICS Software Deployed

ICONICS' GENESIS64™ 64-bit, OPC-integrated, Web-enabled HMI/SCADA suite is currently utilized by SAP Research at the Future Factory Initiative. GENESIS64 provides customers with a 360° view of their entire organization, providing users with the power to quickly and efficiently add 3D symbols and animation to graphic visualizations of business processes and bring them to life.

Project Summary

Researchers at SAP Research's CEC Dresden location have had a chance to put ICONICS "next generation of automation software" to the test in as "real-world" circumstances as they have been able to produce and have remarked on the outstanding quality of this latest ICONICS software solution.

Such a testbed, according to SAP Research helps

to show "leading edge software and the latest hardware developments with different scenarios, products, and prototypes in a distributed manufacturing environment."
Additionally, the testbed "spans multiple manufacturers and demonstrates the viability of prototypes."

Video Presentation

ICONICS has created an online video highlighting its involvement with the SAP Research Future Factory Initiative.
To view this video, visit ***www.iconics.com/videos*** and click the "View and Download" button underneath "SAP Future Factory Initiative Featuring ICONICS."

Introduction to ICONICS' Video Presentation on its Participation in the Future Factory Initiative

Close-up within ICONICS' 3D Representation of the Future Factory Lab

About SAP

SAP is the world's leading provider of business software. Today, more than 46,100 customers in more than 120 countries run SAP® software – from distinct solutions addressing the needs of small businesses and midsize companies to suite offerings for global organizations. Powered by the SAP NetWeaver® technology platform to drive innovation and enable business change, SAP software helps enterprises of all sizes worldwide improve customer relationships, enhance partner collaboration and create efficiencies across their supply chains and business operations. SAP solution portfolios support the unique business processes of more than 25 industries, including high tech, retail, financial services, healthcare and the public sector. With subsidiaries in more than 50 countries, the company is listed on several exchanges, including the Frankfurt stock exchange and NYSE under the symbol "SAP".

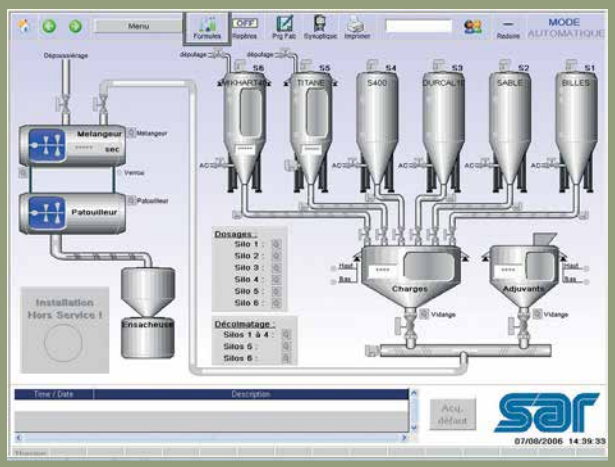
For more information, go to ***www.sap.com***.

Solutions Highlighted

GENESIS64 is ICONICS 64-bit Web-enabled, OPC-integrated HMI/SCADA suite. The new software takes maximum advantage of the convergence of new 64-bit computing machinery, new Microsoft operating systems with 64-bit technology, and the increasing demand for captivating 3D graphic visualization of today's business processes. The "Next Generation of Automation Software" is here.

Signature S.A.
Agnetz, France

A Signature S.A.-Created Road Sign in France



Synoptic Overview of Paint Production

About Signature SA

Compagnie SIGNATURE, a 100 percent subsidiary of Burelle S.A., is the European leader in road signage and road marking. With more than 1,200 employees, Compagnie SIGNATURE has subsidiaries in Spain, Great Britain, Switzerland, Germany, Belgium, The Netherlands, Czech Republic, Romania, Greece and France. France's SIGNATURE S.A., with a network of 37 service points, contributes to the improvement of road safety and street comfort. As a complement to its design, manufacturing and installation activities, SIGNATURE proposes new services in the area of road asset management with the aim of guaranteeing the perpetuity of road marking facilities.

ICONICS Software Deployed

SIGNATURE S.A. selected ICONICS GENESIS32™ HMI/SCADA suite including the GraphWorX™32 and AlarmWorX™32 components, BatchWorX™ Lite, ReportWorX™ (a component of ICONICS BizViz™ Manufacturing Intelligence suite), and WebHMI™ add-on.

Project Summary

SIGNATURE S.A. sought a solution to assist in the automation of its paint plant using a batch process. SIGNATURE S.A., assisted by system integrator ICONICS France Process Control, implemented GENESIS32 and BatchWorX to meet its goal of automating paint production. GENESIS32 was used to connect PLCs (most manufactured by different suppliers) to SIGNATURE S.A.'s system, while the AlarmWorX32 module was installed to ensure traceability. WebHMI was added for remote control via production manager and process engineer stations. Additionally, SIGNATURE S.A. utilizes ReportWorX for daily alarms and event and production data reports. ReportWorX also generates a production report by orders of fabrication (with associated alarms), as well as a weekly report for total consumption of raw materials used in production.

BatchWorX is a product from ICONICS France

Key Features

SIGNATURE S.A. sought several specific features that ICONICS was able to meet and exceed. The selected solution must integrate with batch process software as well as be ISA 88-compliant (as BatchWorX is aptly able to demonstrate). The application must have traceability (as achieved via AlarmWorX32) as well as provide robust, in-depth reporting (a goal met handily by ReportWorX).

The company had a planned project development duration of three months, followed by an expected three weeks of startup/implementation. ICONICS, in tandem with ICONICS France Process Control, was comfortable in meeting the time expectations.

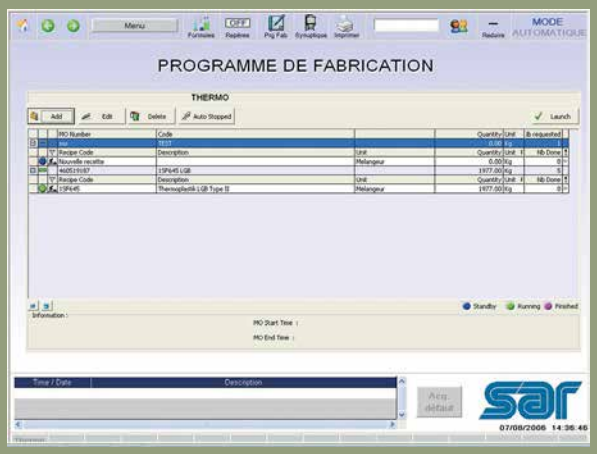
Finally, the selected vendor was required to integrate with two Schneider PLCs and one by Siemens, as well as with the firm's MSDE database – all handled with ease by ICONICS solutions.

Benefits of the System

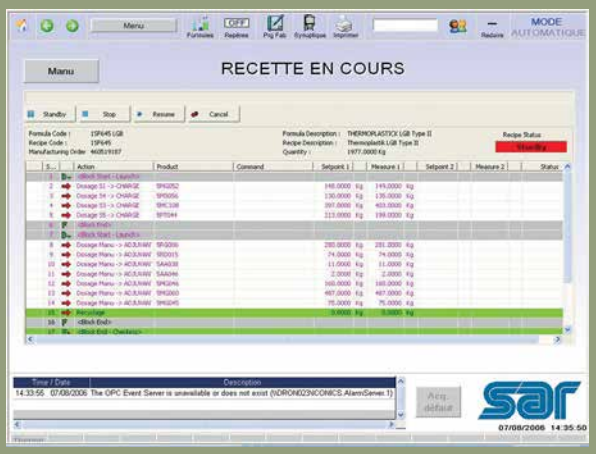
SIGNATURE S.A. sought an "open and evolving system" in meeting its paint plant automation. With ICONICS, they quickly received state-of-the-art solutions to assist in their HMI/SCADA, batch processing, alarm management, and reporting. In addition, the company is able to add on other needed components from ICONICS comprehensive GENESIS32 HMI/SCADA and BizViz Manufacturing Intelligence suites as new needs arise.

Conclusion

Gaining SIGNATURE S.A. as a customer was a good sign for ICONICS. By quickly and exactly meeting the company's needs, ICONICS is also being considered for additional projects including the automation of another workshop and a project involving the connection of all PLCs within the plant for traceability.



Production Schedule at Signature S.A.

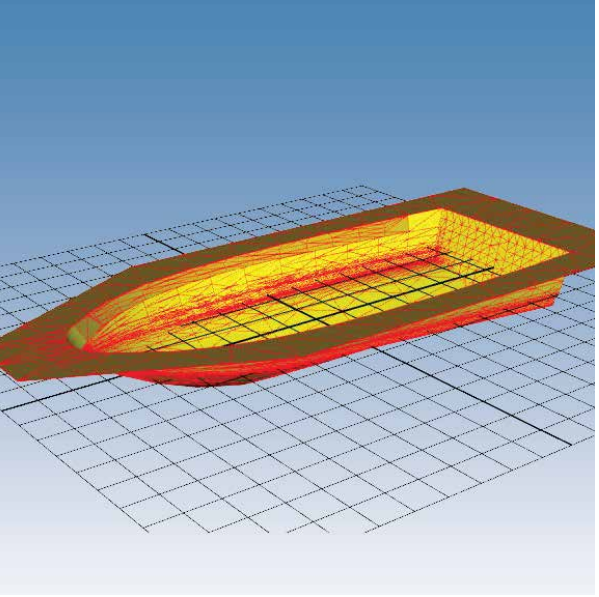


SIGNATURE S.A. Paint Production Recipe in Progress

Solutions Highlighted

ReportWorX
Enterprise Reporting, Charting and Analysis Software

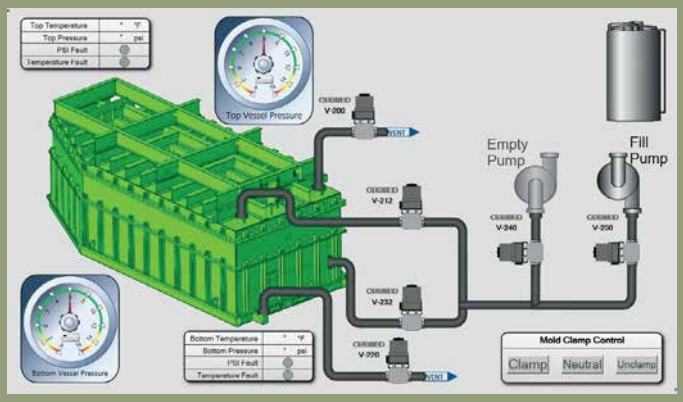
AlarmWorX
Multimedia OPC Alarm Management Software



A 3D Rendering of a Boat During Construction Visualized Through GENESIS64/GraphWorX64

VEC Technology, LLC

Greenville, Pennsylvania / Little Falls, Minnesota



A VEC Technology Fluid Transfer Control Screen

> *"GENESIS64 gave us unparalleled flexibility for creating the content we needed. We just plugged [it] onto our system to communicate with all our existing hardware interface drivers and software. With its GraphWorX64 tool, our HMI visualizations are much more intuitive and it was easy to do it myself."*
>
> **Greg Telesz**
> Director of Engineering
> VEC Technology, LLC

About VEC Technology

VEC Technology's (www.vectechnology.com) Greenville, PA location provides custom composite manufacturing. Its parent company, J&D Acquisitions, also owns Larson Boats (www.larsonboats.com), a Little Falls, MN manufacturer of recreation boat hulls that utilizes the VEC process, "a patented, state-of-the-art, computer-controlled manufacturing process that guarantees that every part is made to the most exacting standards of fit and finish, resulting in parts with unparalleled beauty and unprecedented quality."

VEC Technology considers itself a one stop shop for OEMs, providing part concepts, design, engineering, tooling and manufacturing, with seven molding stations at its Pennsylvania facility.

The company states that manufacturing cells utilizing its Patented Floating Mold technology receive a "low-cost, high-quality, extremely accurate, closed-mold solution" and that VEC Technology has achieved "great success in the marine, construction, containers, transportation, farming equipment and recreational vehicle markets."

Larson Boats, itself a customer of VEC Technology, can process boat hulls in the 17 to 24 ft range at its Minnesota location, which includes eight molding stations and an automation mix plant.

ICONICS Software Deployed

VEC Technology selected ICONICS GENESIS64™ 64-bit HMI/SCADA software, in addition to BridgeWorX™ (real-time workflow for data bridging), ReportWorX™ (enterprise reporting, charting and analysis), OPC Server (supporting both OPC-UA and OPC-DA connectivity), and WebHMI (Web-based, real-time visualization).

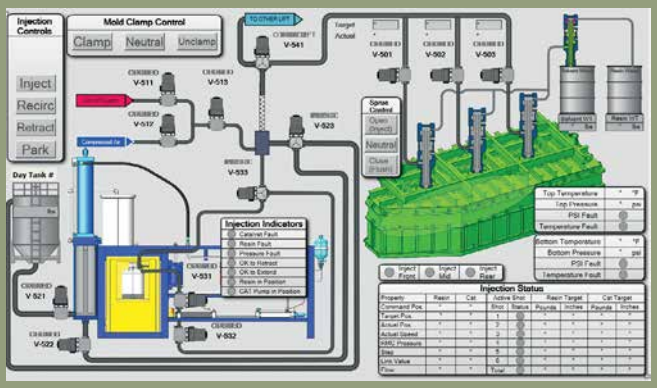
Project Summary

VEC Technology required an HMI/SCADA solution coupled with data bridging/reporting/archiving that can be used over the Web, can integrate with the OPC communications protocol and can directly interface with the company's product databases. They required the solution to control and monitor the company's patented closed molding operations. They wanted a system that could manage various parameters based on several criteria, including the specific product being produced, ambient conditions and material properties. Also necessary was the ability to provide long term storage of multiple key parameters for product warranty information.

The company sought a product with future-proof technology. They also looked for a solution that presented a simple user interface for making edits, as well as an easily maintained Web-based client/server architecture. VEC Technology aimed for a "single vendor" approach, intending to reduce both the number of automation interfaces as well as extra support staff to maintain various systems.

The engineers at VEC Technology allowed themselves a 10-month development cycle for the first installation, ensuring that their in-house personnel would become more familiar with the selected HMI/SCADA solution. The software would need to interface with multiple systems and hardware including eight Modicon PLCs between the two locations, five Delta RMC controllers, temperature/pressure/proximity gauges, scales and valves. The selected HMI/SCADA software would need to handle approximately 1,200 tags per molding station.

VEC Technology maintains four servers and 16 client stations for this particular project. It uses several Microsoft applications including Microsoft Office, Access (to modify process input parameters) and SQL Server (for long-term historical data storage). Two competitor solutions were considered, and the company had the option to keep their existing software (also by different competitors), before ultimately deciding upon ICONICS.



Injection Control Screen

VEC Production Facility

Benefits of the System

VEC Technology wanted a single source HMI/SCADA program that would require minimal custom scripting and programming. They also required a solution that would run optimally on 64-bit operating systems, as well as easily handle 3D visualization to fully utilize existing CAD data of various equipment.

Continued on the next page...

Additionally, they wanted the software to read and write natively to Microsoft SQL Server and to support global aliasing, in order to minimize development time and costs.

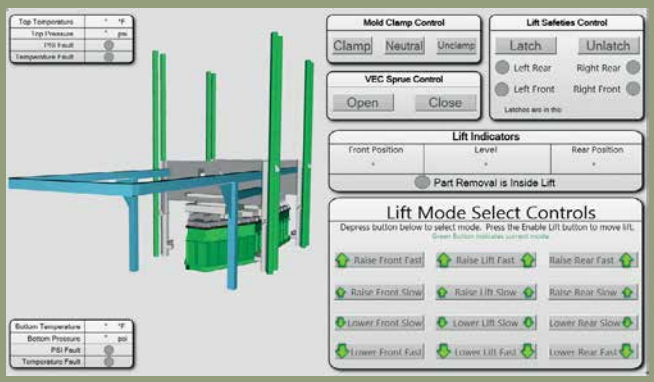
GENESIS64 now provides what VEC Technology deems "spectacular" and "rich" 3D graphics with "superb resolution" and an enhanced operator experience, fully utilizing the company's vast CAD investments. The company now utilizes a single database for data logging. ICONICS' BridgeWorX software has helped to eliminate numerous custom VBA scripts. VEC Technology has also reprioritized its operational staff – from eight employees tasked with maintaining multiple systems down to two employees maintaining their new system.

The company's future plans for their ICONICS-integrated application include implementation of downstream postmolding stations to input quality data into databases, eliminating the need for paper forms.

Case Study Details

- HMI/SCADA Solution
- OPC Server
- 1,200 Tags per Molding Station
- 3D Visualization for CAD Data

An Operator Monitoring Hull Production



VEC Technology Lift Select Mode Controls

Conclusion

VEC Technology and Larson Boats required an HMI/SCADA solution that would allow them to continue providing customized options for their own customers. For such requirements, ICONICS' GENESIS64 HMI/SCADA suite and wide range of integrated manufacturing intelligence options are tailor-made.

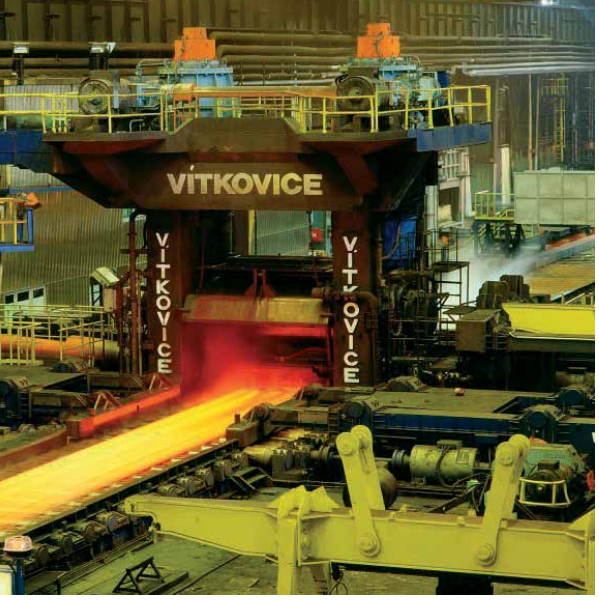
Solutions Highlighted

GENESIS64
Next Generation in HMI/SCADA Automation Software

BridgeWorX
Real-time Workflow for Data Bridging

ReportWorX
Enterprise Reporting, Charting and Analysis Software

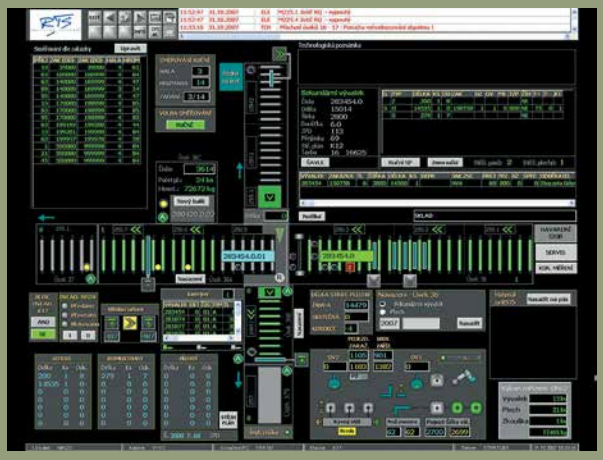
WebHMI
Web-Based Real-Time Automation Software



Vitkovice Steel's 3.5 Meter Four-High Rolling Mill

Vitkovice Steel
Ostrava, Czech Republic

VÍTKOVICE STEEL
EVRAZ GROUP



Roll Transporter System Monitor at Vitkovice Steel

About Vitkovice Steel, a.s.

Vitkovice Steel, a.s., a member of the Evraz Group S.A., is a leading European manufacturer of rolled steel products. The company's main product mix consists of plates, sections, sheet piles, and flame-cut shapes. The largest steel plate manufacturer in the Czech Republic, located in the city of Ostrava in the Moravia region, Vitkovice Steel produced 802,000 tons of steel products in 2005, mostly high-quality steel plates.

ICONICS Software Deployed

Vitkovice Steel selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite, including AlarmWorX™32 distributed, enterprise-wide alarm and events management system and DataWorX™32 OPC data aggregation, bridging, redundancy and tunneling.

Project Summary

Vitkovice Steel needed to replace a production monitoring system from the late 1980s, in addition to control systems based on obsolete Czechoslovakian computers (PPC-4). The company, working with systems integrator Real Time Software (R.T.S. c.s., spol. s.r.o.), selected a system based on ICONICS GENESIS32 integrated with Oracle databases.

The new Plate Mill Coordination System, "KSUP", was gradually phased in, eventually replacing the former, out-of-date management execution system and the control systems of key production aggregates (units of 3.5 meters, four-high Rolling Mill). The key units contain lengthwise trimming and cutting power slitters/shears, two cross-cutting power shears and roll-transporters.

The GENESIS32 software suite is used for the automatic monitoring of material moving on roll-transporters as well as of material stored in piles. Operators at service boxes are automatically supplied with all necessary information needed to process the material. The complete production settings are also automatically passed on to the appropriate production aggregates.

GENESIS32 runs on 26 client stations, providing approximately 40 main operating and overview screens with an additional 250 pop-up window support screens. The diverse user group ranges from

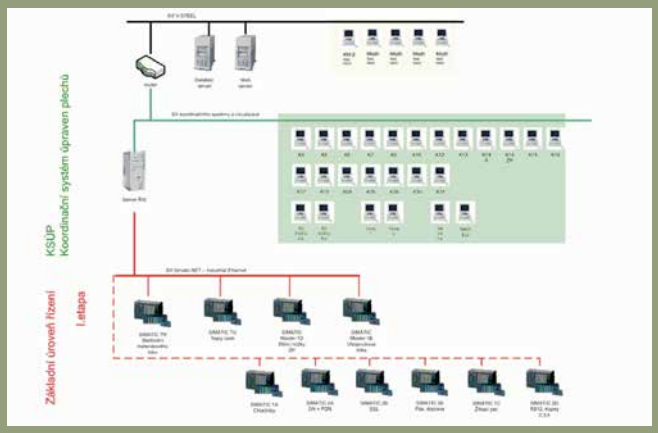
general plant and service personnel and guests to developers, administrators and supervisors.
The system picks the overall production settings from the superior PPS system. The KSUP system automatically registers all the key parameters of individual production operations and stores them in the Oracle database. In addition, all alarm and event messages are posted and archived, using AlarmWorX32.

Benefits of the System

The steel manufacturer is pleased by their selection, as it meets their high availability, 24x7 requirements, as well as scales to the needs of about 180 users. With their new ICONICS system, Vitkovice Steel is able to replace older equipment in order to guarantee related maintenance and service. They're able to respond, with greater flexibility, to user requests in regards to varying production patterns.
Integration with existing systems, including KEP Servers, Stratus Servers, Siemens Simatic S7 PLCs, Oracle 9.2 data base, UZ line-over databases, stampers in hot or cold conditions (3964R), and paint stampers is seamless. The ICONICS solutions also connect easily to the company's existing Microsoft products, including Windows 2003 Server, Windows 2000 and XP clients, Microsoft Office and SQL databases.

Conclusion

When Vitkovice Steel was faced with aging equipment and needed fast, reliable replacement, they immediately considered ICONICS. With existing systems to consider, ICONICS was certain to be the right fit, so much so that Vitkovice Steel is considering additional solutions for "fast and easy integration of new production aggregates".



KSUP Systems Overview at Vitkovice Steel

Manufacturing Monitoring Screen

Case Study Details

Vitkovice Steel selected ICONICS solutions because they meet specific criteria, including:

- Low Total Cost of Ownership
- Excellent Connectivity to Oracle software
- Easy Application Development

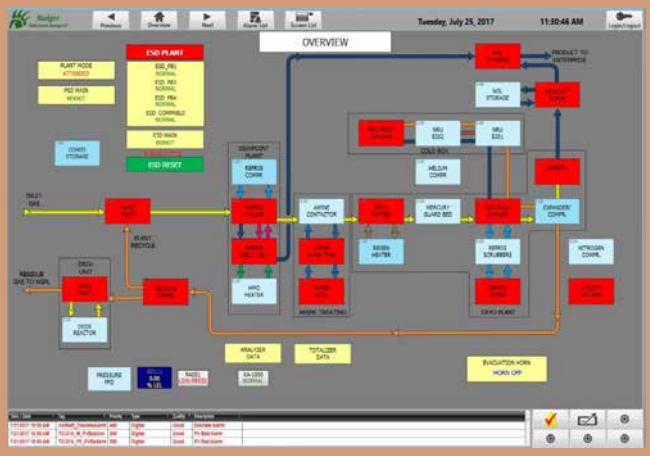
"We have a very positive opinion of ICONICS [...]. It has helped to save time and costs for our oil and gas industry clients requiring flexible, extendable visualization solutions, as well as in our company's development processes."

Vyacheslav Zavyalov
Control System Specialist
SC «ATS» Company , Ltd.

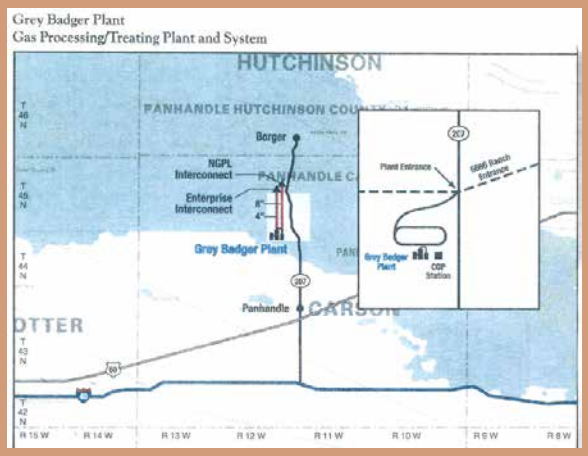
OIL, GAS & PETROCHEMICAL

Badger Midstream
Panhandle, Texas

Badger Midstream's Houston, TX Headquarters



Grey Badger Plant Overview Created via ICONICS GENESIS64™



System Map of Grey Badger Plant

About Badger Midstream

Badger Midstream (www.badgermidstream.com), located in Houston, Texas, is a natural gas/natural gas liquids transportation, gathering and processing midstream company created to acquire and exploit midstream assets in the natural gas energy sector. It was found to significantly improve the midstream value chain by working with customers (producers, operators, pipelines, end users and other midstream companies) to determine needs and provide real, creative, cost-effective, technical, results-oriented solutions.

ICONICS Software Deployed

Badger Midstream, working with system integrator, SOAP Engineering (www.soapeng.com), selected ICONICS' GENESIS64™ HMI/SCADA suite, including WebHMI™ Web-based real-time automation software, as well as the MobileHMI™ data mobility suite.

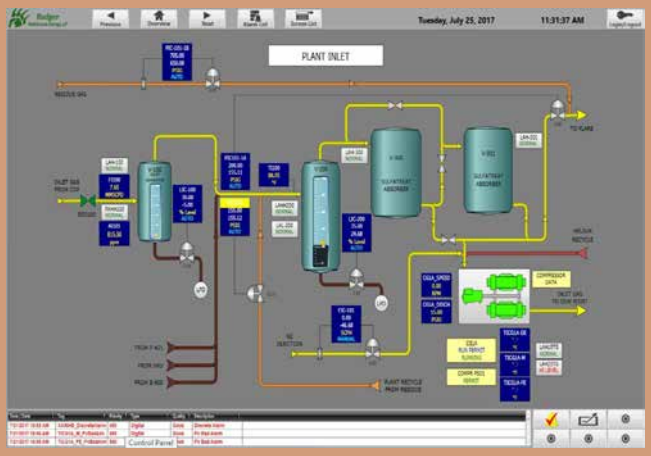
Project Summary

Badger Midstream's Grey Badger site in Panhandle, Texas is a cryogenic gas processing and treatment plant. Initial capacity of the plant is 25,000 Mcf/d. It has four miles of steel NGL pipeline and 4.5 miles of 8' steel high pressure residue pipeline. The plant is an ultra-high recovery cryo plant with ethane rejection capability, amine treating, nitrogen rejection, helium recovery, and condensate stabilization.

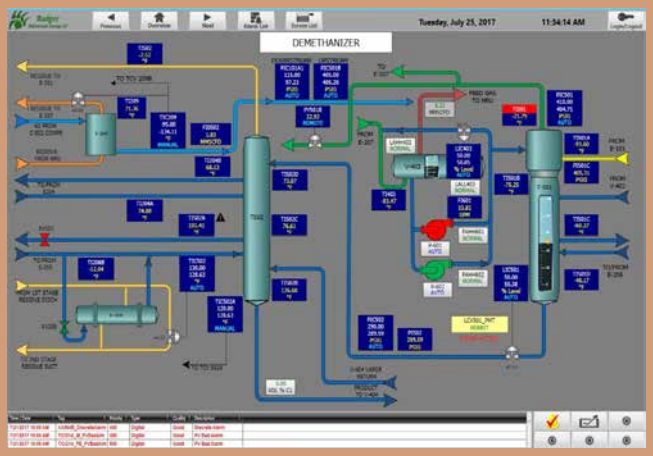
The company sought an HMI/SCADA solution to control all the processes of the Grey Badger gas plant including plant metering, compression monitoring, tank/pump/valve control, and the monitoring and control of 105 proportional-integral-derivative (PID) control loops. The new solution would replace an existing system based on a combination of two competitor products due to lack of support of their installed product versions and comparatively high costs of upgrades and yearly/ongoing maintenance charges.

WebHMI, and MobileHMI automation software was the right decision. The company stated that the cost for the entire installation of ICONICS products was half of just the upgrade cost for only one of its pre-existing competitor products. The new ICONICS software now helps to provide full plant control and metering of over 8,000 physical I/O points.

Associated process displays and faceplates were streamlined, providing enhanced process clarity



Plant Inlet Control Screen



Demethanizer Monitoring and Controls

Understandably, Badger wanted their new solution to be more cost-effective and easier to maintain.

The selected HMI/SCADA would need to integrate with the plant's DeltaV DCS control, Allen Bradley controllers, Emerson OPC Server, and various electronic flow meter (EFM) remote terminal units (RTUs), as well as with various plant equipment including heaters, dehydrators, vapor recovery units, separators, heat exchanges and more.

Benefits of the System

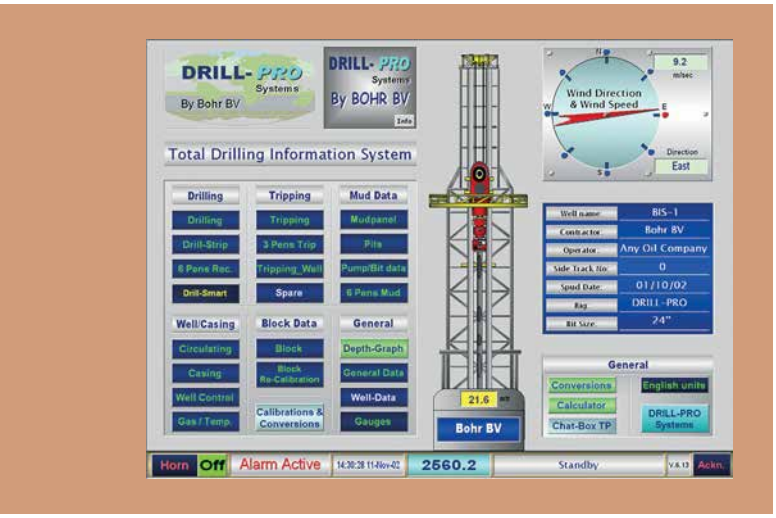
Badger Midstream knew almost immediately that their investment in ICONICS GENESIS64, and control to operators compared to the former system. In addition, multiple new features were gained, such as remote monitoring, mobile displays and notifications.

Conclusion

Badger Midstream plans to expand its installation of ICONICS automation software. The company would like to provide detailed dashboards to executives to show details including plant profitability, downtime and other associated metrics. For the company involved with cryogenic gas, the decision to remain with ICONICS was quite natural.

Bohr Instrument Services
Veenoord, The Netherlands

Drilling Rig Utilizing Bohr Instrument Services



Bohr's DRILL-PRO Systems Menu Display

"Extensive visualization of all the key parameters by the GENESIS32 software system helps the drilling operator to prevent problems, drill more efficiently and reduce drilling time, which translates into overall cost savings."

Bohr Instrument Services

About Bohr Instrument Services

Oil and gas producing companies in the world explore on both land and sea to produce oil. Global energy companies that explore for oil and gas produce and refine oil and market their products throughout the world under their corporate brand names, and many use Drill-Pro Systems by Bohr BV. On exploration sites worldwide, these oil companies have installed a Bohr "DRILL-PRO" System with ICONICS software to monitor and control all the operations of the drilling rig.

ICONICS Software Deployed

Bohr Instrument Services selected ICONICS GENESIS32™ software suite with GraphWorX™32, TrendWorX™32 and AlarmWorX™32. This suite of software tools is installed on a Bohr DRILL-PRO Total Drilling Information System, which is an extensive data acquisition system for oil and gas rigs. This system must collect data in real time and monitors all the extreme forces on a drill bit while providing the drilling operator with multiple graphical data monitors that visualize all the collected data using the GENESIS32 software tools.

Key Features

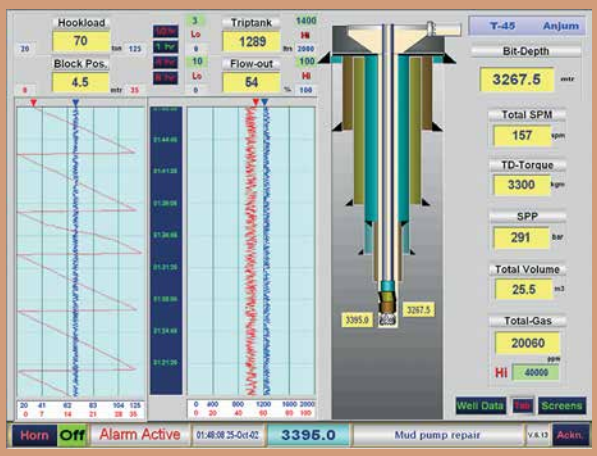
The DRILL-PRO package gathers data from digital and analog rig site sensors via a PLC data acquisition unit. It uses a direct RS-232 serial connection between the DRILL-PRO System, interfaced to a Modbus server and Nyquist PLC. The operator PC collects data and is transmitted to two locations; the drill floor, where an operator views the graphic representation of the data on an 18" monitor, and to remote offices. This drill floor HMI monitor communicates with the data acquisition module (DAQ) to pass on information concerning screen types, scales, alarm limits and manual entries by the operator (depth, bit

depth, pump efficiency etc.). The same real-time data is communicated wirelessly via an 802.11b network protocol to three separate computers in the engineering and project management offices. The many parameters that need to be logged and converted into other parameters demand a software system that can process an unlimited amount of real-time data from a variety of inputs. The system utilizes a distributed I/O architecture, saving costs and providing for flexible layouts and better reliability overall.

tion, weight on drill bit, hole volume, running time and pipe counts. This almost overwhelming amount of information is collected by the ICONICS software system and presented in several clear graphical displays. The operator selects which screen to view using a touch screen and can then set parameters and alarm conditions as required.

Benefits of the System

The primary benefit that the ICONICS GENESIS32 system provides is the ability to do "vertical trending". Data collected at the drill head and sent to the



A DRILL-PRO Trip/Well Display by Bohr

Virtual Gauges

Project Summary

The DRILL-PRO monitoring system required an easy to use, user selectable graphical and alphanumeric display software system. The ICONICS GENESIS32 software suite met these requirements, which included alarm monitoring of all the primary instrumentation. The installed system has the flexibility needed for customization and the modular structure of the software allows for easy configuration changes and upgrading. The DRILL-PRO system accepts signals from a large number of sensors (rotary RPM, depth, pump pressure, temperature and tank levels).

The values measured by these sensors are displayed in several graphical screens and used to calculate other important derived parameters like rate of penetration, weight on drill bit, hole volume, running time and pipe counts. This almost overwhelming amount of information is collected by the ICONICS software system and presented in several clear graphical displays. The operator selects which screen to view using a touch screen and can then set parameters and alarm conditions as required.

engineering and management offices' computers are stored in triple redundancy in a Microsoft Access™ database. This data is "persistent trended" and stored in RAM memory for immediate access, along with "historical trended" data, which is stored on their hard drives for analysis.

Other advantages of the ICONICS software system are the ease of use, ease of setting up screens and the extensive visualization display capabilities for the operators to view real-time data.

Conclusion

ICONICS has worked closely and successfully with Bohr Instrument Services BV to make this Oil Rig Monitoring project successful in every aspect.

ENSTOR's Caledonia Facility

ENSTOR
United States

Map of ENSTOR's Locations
North America

"We like the versatility of GENESIS32. We use ICONICS software not just for graphics and control, but for our Plant Historian as well. With the flexibility of OPC, we can easily integrate GENESIS32 with the two Accelemetrics products, CommFidence and the Gas Storage Processing Engine. With the Kepware OPC Server, we can connect any PLC that we have. As we are often acquiring new facilities with different software and PLCs, GENESIS32 and Accelemetrics products have been a great fit for ENSTOR."

Larry Whitaker,
Operations Control Manager
ENSTOR

About ENSTOR

Natural gas is an important energy source for reducing pollution. Compared to coal and oil, combustion of natural gas releases significantly lower amounts of harmful pollutants and carbon dioxide. After its exploration, production and transportation, natural gas can be stored for an indefinite period of time for future use.

Reconditioned depleted reservoirs and salt caverns make ideal vessels for storing natural gas. Depleted reservoirs are formations that have been tapped of all their recoverable natural gas. Salt caverns are made in salt bed deposits left from when sea covered the land. By drilling a well down into the salt bed, and cycling large amounts of water through the well to dissolve the salt, large caverns can be created. ENSTOR, a subsidiary of Iberdrola Renewables, is a company dedicated to the storage of liquid natural gas. With facilities including both depleted reservoirs and salt caverns, ENSTOR maintains five repositories throughout North America, and is currently developing two more sites. ICONICS software, implemented by Accelemetrics, Inc., an ICONICS Gold Certified Partner, helps ENSTOR to responsibly and safely receive, store and deliver natural gas, the cleanest burning fossil fuel.

ICONICS Software Deployed

GENESIS32™ is used to monitor and control ENSTOR's storage plant facilities. AlarmWorX™32

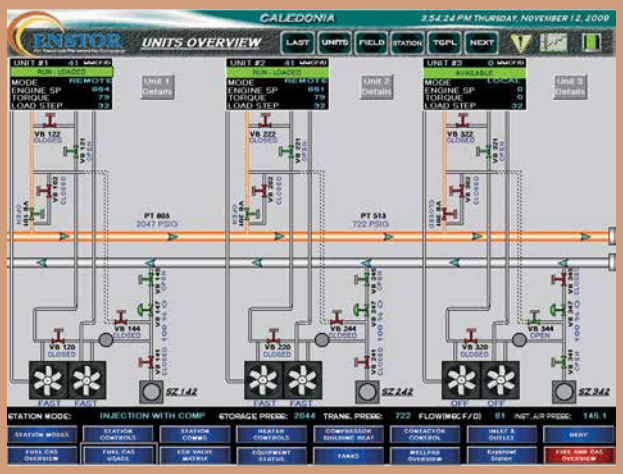
and TrendWorX™32 modules help operators maintain efficiency. BizViz™32 and PortalWorX™32 deliver visualization to the corporate level.

Project Summary

ENSTOR leverages its various gas storage and hub service facilities to provide customers superior transfer access between major pipelines as well as rapid injection and withdrawal storage capacity. In ENSTOR's facilities, the GENESIS32-based control system uses PLCs and gas flow computers that monitor and control a variety of compressors, gas meters, valves, dehydrators, other downstream information systems. PortalWorX delivers a higher level corporate view to headquarters in Houston.

ICONICS' software solution demonstrated its flexibility and ease of use with installations taking only a few months at each facility. Accelemetrics was able to build several specialized gas storage specific applications that tied into GENESIS32. Specifically, by leveraging ICONICS DataWorX OPC tunneling and data aggregation capabilities, Accelemetrics built CommFidence, a customized gas storage proactive alarming system. The system monitors connectivity between natural

Overview of the Caledonia Storage Facility



Compressor Overview of Caledonia Storage Facility

and safety equipment to manage natural gas injection, withdrawal, receipt and delivery.

The Alberta Hub in Canada, Caledonia in Mississippi, Freebird in Alabama, Grama Ridge in New Mexico, and Katy Hub near Houston, Texas comprise ENSTOR's strategically located gas storage facilities. In addition, the Katy facility serves as the corporate centralized monitoring and control location.

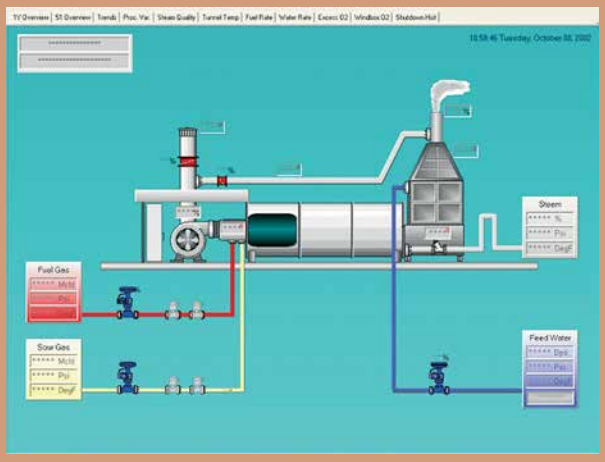
Each location has a dedicated control room where operators monitor and control both storage plant and pipeline interconnection points (where customers deliver and receive gas). TrendWorX data from five facilities is relayed to the Katy Storage facility into an Accelemetrics gas storage data warehouse, where data can be reported and interfaced with cleanly by gas flow computers and chromatographs to confirm that communication is successful, intelligently checks for specialized gas measurement errors, and monitors overall system functionality. The Accelemetrics Gas Storage Processing Engine performs a variety of facility operational functions including line pack calculations, compressor fuel monitoring, well volume allocations, plant balancing and regulatory emissions reporting.

Conclusion

With five operating facilities through North America, and two facilities under development, ENSTOR realizes operational flexibility demanded by volatile North American natural gas markets. Plans are in place to upgrade to the newest version of GraphWorX.

LIIEC Oil Company
Western United States

Oil Rig, Similar to Those Used by Large International Integrated Energy Co.



Steam Plant Overview

> *"Users are really impressed with the trend and alarm analysis capabilities. Web capabilities are the same as SCADA system capabilities, too. The product is completely built on OPC standards, making integration with other OPC products simple."*
>
> **LIIEC Facilities Engineer**

About This Large International Integrated Energy Company

A Large International Integrated Energy Company (LIIEC) with over $100 billion in annual revenue is a global energy enterprise developing vital energy resources in over 180 countries around the world and is a world leader in oil exploration and production. The USA-located, ICONICS-managed oil field has in excess of 3,000 drilling wells that are using WebHMI™ software to monitor oil well performance, production analysis and maintenance operations.

ICONICS Software Deployed

The GENESIS32™ product is installed using the following modules: AlarmWorX™32 Multimedia, TrendWorX™32 SQL Logging Option, and AlarmWorX™32 SQL Logging Option, Pocket GENESIS™ and WebHMI.

Key Features

Modicon and Allen Bradley PLCs are used to monitor and control steam plants, sulfur plants, oil pumps, and oil storage in the West Coast Business Unit of LIIEC. GENESIS32 and WebHMI are used to monitor the status of all I/O points and provide Human Machine Interface for all areas. The open connectivity provided through OPC-enabled WebHMI allows LIIEC to easily provide process data, graphics and trends with live data for any qualified user via the Web.

Project Summary

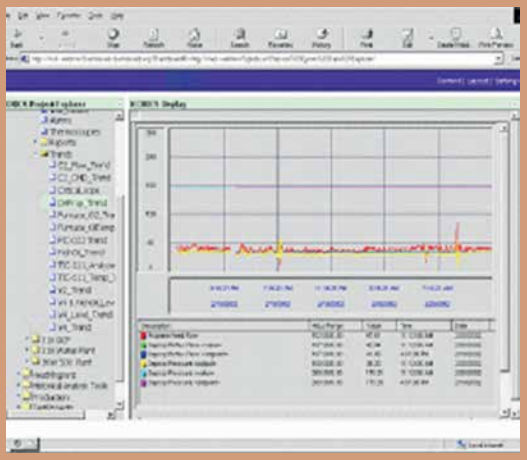
LIIEC installed ICONICS' GENESIS32 suite of tools to deliver data from any LIIEC Business Unit facility in the entire Western US area to any user anywhere within the LIIEC Intranet. In the West Coast Business Unit, there is a total of six major oil fields

with numerous facilities controlled by Modicon and A-B PLCs. GENESIS32 and WebHMI and various OPC Servers present the data from all of these systems to LIIEC users via the Web.

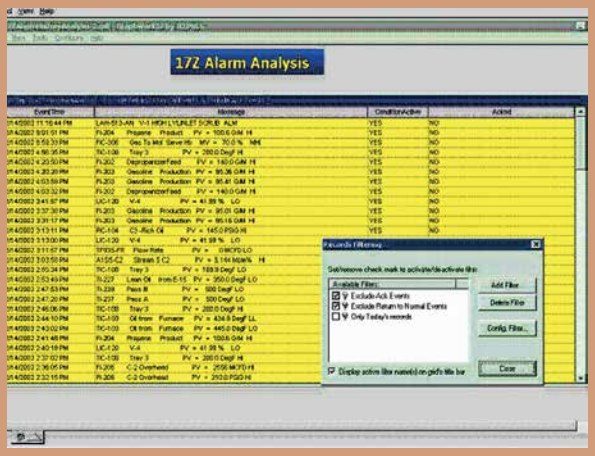
A pilot system was installed at one of the LIIEC oil fields. There are currently five GENESIS32 systems and two WebHMI Servers with 50 Client Licenses in use. Pocket GENESIS and AlarmWorX32 Multimedia will be used to provide wireless access and notification for operators in the field. Approximately 15,000 I/O tags are monitored and controlled through these systems.

alphanumeric pagers and telephones when critical systems require immediate attention.

LIIEC uses WebHMI to provide view-only access for management and supervisory personnel. WebHMI, running on Windows 2000 and Internet Information Server from Microsoft, provides real-time OPC data for the view-only screens. Benefits of the system include faster responses to equipment shutdowns through a more automated notification process with AlarmWorX Multimedia. Another benefit is increased generator energy efficiency through trend analysis and remote monitoring.



Steam Production Trend



Alarm Summary Display

Benefits of the System

Local operators, supervisors and technical management staff view trend data from the entire system via an ICONICS WebHMI Server using GenBroker routing over their Wide Area Network. Users can view daily, weekly, and longer trends, as needed, to manage the flow of oil through the plants and into the distribution and storage network.

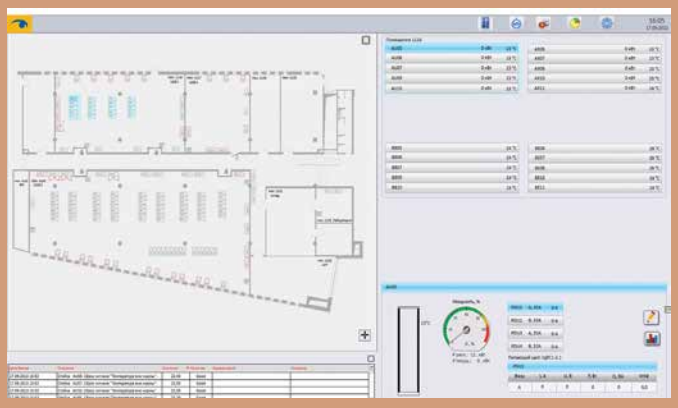
In addition to viewing real-time alarms and system faults, Microsoft SQL Server is used to record all Alarms, Events and Operator Actions for long term alarm archiving and alarm reporting. Several local Operator Stations are equipped with the ICONICS Multimedia Alarm Notifications Option software so that supervisors and operators may be notified via

Conclusion

ICONICS has worked closely with LIIEC to make this Oil Field Data Collection project successful in every aspect. LIIEC participates in the Large End-User Support and Maintenance program to keep its software updated and for access to technical support personnel as needed. Rapid graphic development, easy Web publishing and zero-install clients for Web access were key features considered during LIIEC's decision-making process.

Moscow, Russia

LUKOIL
Moscow, Russia



Steam Plant Overview

About LUKOIL

LUKOIL, headquartered in Moscow, Russia, is a major, international, vertically-integrated oil and gas company, accounting for 2.1 percent of the global output of crude oil. It is the largest privately owned oil and gas company in the world by proven oil reserves and is the third largest privately owned oil and gas company by oil production. LUKOIL handles 16.3 percent of Russia's crude oil production and 16.7 percent of the country's crude oil refining. It is one of the biggest Russian oil business groups with $139 billion revenue and net income in excess of $11 billion. Its strong position is the fruit of 20 years' work in expanding its reserve base and increasing its scale of business by seeking out and executing strategic transactions.

About NVision Group

NVision Group is one of the largest developers and suppliers of unique solutions and services in the Russian IT market. Its solutions help customers to achieve their strategic objectives both through improving the efficiency of the entire IT infrastructure, and through optimization of individual business processes. The company specializes in the design of systems used to significantly reduce business informatization costs. It aims to protect clients' business and develop new services, while striving to enhance their quality level.

ICONICS Software Deployed

LUKOIL, working with NVision Group, selected ICONICS GENESIS64™ HMI/SCADA software, including its GraphWorX™64 data visualization tool; Workbench centralized configuration environment; GridWorX™64 real-time spreadsheet visualization/control tool; AlarmWorX™64 distributed, enterprise-wide alarm management system; and TrendWorX™64 plant-wide data collection, logging, charting and analysis solution. LUKOIL also uses ICONICS WebHMI™ Web-based real-time automation software along with GENESIS64's publishing wizard.

Project Summary

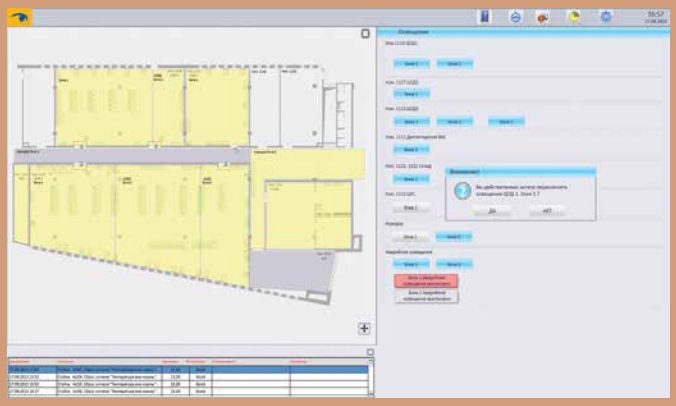
LUKOIL sought an HMI/SCADA system for a planned datacenter, the latest of many among the company's widespread IT infrastructure, in its new Moscow company office. Working with NVision Group, the compa-

ny sought a solution that can provide maximum security and performance of datacenter utility systems while also ensuring high energy efficiency. LUKOIL's datacenter computer rooms include over 100 server racks, each designed with a capacity of 17kW of power.

In addition, the company mandates that its utility systems have 24/7 control capability.

The company wanted an HMI/SCADA system that could provide estimates for the datacenter rooms' technological and climatic metrics and could quickly acquire status information for all nodes of power and cooling/air conditioning systems. As the planned datacenter was to include approximately 5,000 data points, LUKOIL sought an HMI/SCADA solution that easily centralizes functional mode management for utility systems.

Steam Production Trend



Light Switching Display

Benefits of the System

Currently, ICONICS' GENESIS64 HMI/SCADA suite assists LUKOIL's operational department in the efficient and secure placement of equipment in server racks, based on:

- Actual Power Load by Rack Design
- Power Load Level by Electric Phases
- Nominal Value Ratio of Actual Power Load to Embedded Switches

LUKOIL's new HMI/SCADA system now helps users to monitor critical cases and trends, including power distribution deviations for each level of electrical power supply system, from incoming switchgear to certain server racks. GENESIS64 is used to provide an ergonomic interface design, developed specifically with consideration of operating personnel efficiency. Users of the new system are now able to view data from different subsystems in a single window, allowing for the comparison and analysis of information without additional reports and needless switching between windows.

Conclusion

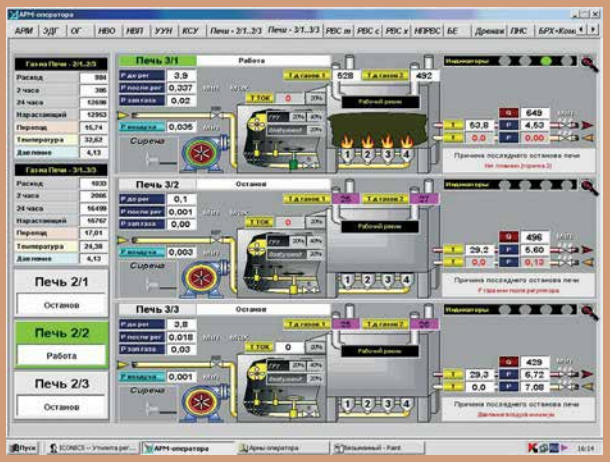
Since selecting ICONICS software solutions to meet their project needs, LUKOIL and NVision Group have designed controls and interfaces using existing component templates found within GraphWorX64, as well as components developed especially for this project. The companies have found that, due to the wide graphic and functional abilities of GENESIS64, users now can:

- Process High-quality Vector Images of Infrastructure Elements
- Import Data from Connected Databases into Easy-to-Understand Table Views
- Build Customized Historical Trends
- Download Reports for Certain Periods and Systems
- Analyze Different Data

Russian Oil Processing Plant
Client of SC «ATS»

SC «ATS» Company, Ltd.
Tyumen, Russia

SC «ATS»



A Control Screen for Oil/Gas Applications

> *"We have a very positive opinion of ICONICS and its GENESIS32 HMI/SCADA suite. It has helped to save time and costs for our oil and gas industry clients requiring flexible, extendable visualization solutions, as well as in our company's development processes."*
>
> **Vyacheslav Zavyalov**
> Control System Specialist
> SC «ATS»

About SC «ATS»

SC «ATS» specializes in the design, creation, introduction and tracking of automation systems in the Russian petroleum and natural gas industries. SC «ATS» acts specifically as a system integrator, providing design for, delivery of, and service to gas and oil-producing industry control systems.

ICONICS Software Deployed

SC «ATS» has selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite; including the TrendWorX™32 enterprise-wide data collection, logging, charting, reporting and analysis component and the DataWorX™32 OPC data aggregation, bridging, redundancy and tunneling add-on; for its suggested industrial automation software solution.

Project Summary

SC «ATS» works with multiple plants in the Russian oil and gas industry. Recently, the company was involved in providing control systems in three locations: OAO Surgutneftegaz, with more than 40 objects; NK Rosneft, with more than 20 objects; and TNK BP (Tumenneftegaz), with more than 10 objects. The multiple objects to control at each plant make use of a wide variety of technologies, including radio, GSM/GPRS, Wi-Fi and Ethernet connectivity. In total, there are approximately 16 distributed control stations on area objects and about 118 on telemechanical systems.

The types of connected devices include multiple controllers, flowmeters and heater controllers from B&R and Siemens, which are connected to ICONICS' HMI/SCADA interface via OPC servers. The OPC servers themselves are used primarily for data collection, while OPC loggers are for reporting/logging and SQL servers are used for data storage. The total number of I/O points ranges from

four on the telemechanical control systems to up to 14,000 on area object points.
SC «ATS» uses Microsoft software in its control system solutions, including SQL Server and Microsoft Office (Excel, Access, etc.).

Benefits of the System

SC «ATS» had multiple criteria for their preferred industrial automation software. Among the reasons why ICONICS was selected were:

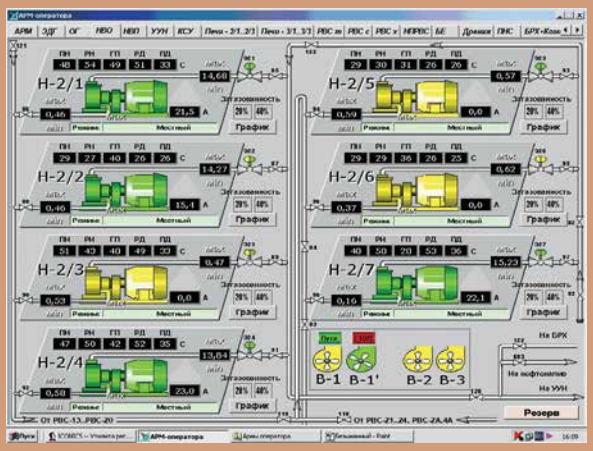
- Convenience - due to ICONICS "off-the-shelf" solutions
- OPC Technology Support
- Flexibility During System Development and Maintenance
- License Variety and Choice

ICONICS GENESIS32 was selected to replace a proprietary, in-house visualization system and was implemented quickly, compared to the previous solution. SC «ATS» knew immediately they had made the right choice, in that system response to events now occurs in less than a second. Objects are easily visualized in a user-friendly Web interface and the installed system has been deemed easy to expand. In addition, the company has realized improvements in overall system-level security and in the oil and gas processes themselves.

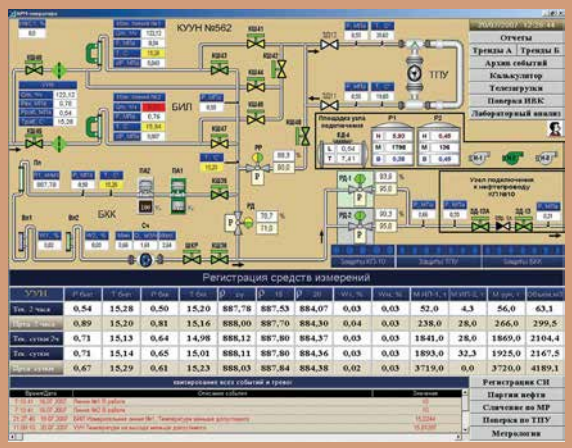
ICONICS has cut overall development time for SC «ATS»'s control systems, as well as the number of personnel required for system design and maintenance.

Conclusion

SC «ATS» plans to expand its ICONICS installations at its client plants whenever related equipment requires maintenance or replacement or as customers require any new functionality. Presently, the company anticipates no less than 10 projects a year requiring control system solutions. ICONICS has proven itself a valuable software partner for SC «ATS» and its many Russian oil and gas customers.



An Additional Plant Control Screen at SC <<ATS>>



Example of GENESIS32 Control Screen for Russian Oil/Gas Customers

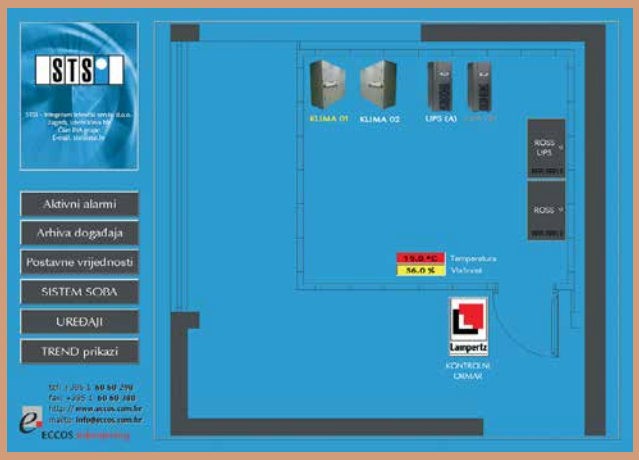
Solutions Highlighted

DataWorX32
OPC Data Aggregation, Bridging, Redundancy and Tunneling

TrendWorX
Data Logging, Charting and Reporting Software

STSI d.o.o. Integrated Technical Services Employees at Work at a Croatian Plant

STSI d.o.o. Integrated Technical Services
Zagreb, Croatia



Main Screen for STSI d.o.o. Integrated Technical Services' Datacenter Control

About STSI d.o.o. (Integrated Technical Services)

STSI - Integrated Technical Services, located in Zagreb, Croatia, is involved with engineering, maintenance, research and production projects within the Croatian oil, gas and petroleum products industry. The company is part of the INA Group (Industrija nafte d.d.), which is a joint stock company owned by the Hungarian oil company MOL (47.16%), the Republic of Croatia (44.84%) and private and institutional shareholders (8.00%). Founded in 2001, STSI - Integrated Technical Services' goals are to:

- Develop safe, efficient and high quality property and technical/technological process maintenance systems based on market principles
- Improve technology and resource integration, as well as use their advantages in a competitive market approach, and
- Develop a highly expert work force as the basic value of the company in the frame of socially acceptable criteria and principles.

ICONICS Software Deployed

STSI - Integrated Technical Services, working with systems integrator, ECCOS inženjering (also of Zagreb), selected ICONICS' GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA Suite, as well as the WebHMI™ Web-based Real-Time Automation and AlarmWorX™32 Multimedia (MMX) Distributed Enterprise-wide Alarm Notification add-ons.

Project Summary

As soon as STSI - Integrated Technical Services decided that the datacenter in its Zagreb headquarters was becoming out-of-date, it made plans for its replacement. The facility is used to house computer systems and associated components, such as telecommunications and storage systems. The new datacenter was designed to include a backup power supply (an Eaton/Powerware UPS system consisting of two UPS devices working in parallel mode), YORK air conditioning units (which are connected to the public power network) and a soon-to-be-installed diesel generator.

STSI - Integrated Technical Services selected specific equipment for its data center, essential for its continuous operation. The datacenter was designed to include state-of-the-art security, supervision and control. The

company sought a SCADA system that would monitor and control crucial parameters such as power supply, temperature/humidity, AC status/mode, UPS status/mode, branch circuit current, individual circuit breaker status, raised floor conditions (via water sensor), technical security (room doors/cabinet doors/air hatch open or closed, fire alarm status), and PLC status.

ICONICS' GENESIS32 HMI/SCADA suite now integrates with STSI - Integrated Technical Services' Schneider Electric Premium TSX P57 PLC, which is connected to a Lampertz security room control panel and Schneider Electric/Merlin Gerin circuit breakers. GENESIS32 also interfaces with the company's Schneider Electric EGX400 Powerlogic Ethernet Gateway (connected to a Carel pCO2 OEM HVAC/R control for the YORK ACs via RS48); a Veris H704 Series Branch Circuit Current Monitoring System; Schneider Electric ION 7650 Power Meters and the Eaton/Powerware 9355 UPS (via SNMP).

In unison with the company's Matrikon OPC Server for Modbus, ICONICS' GENESIS32 is used to collect data from all connected devices. AlarmWorX monitors for any unusual or extraordinary circumstances, including lack of/distortions in the power supply, deviations of the nominal voltage more than 10% (or of any threshold set by the administrator), current higher than pre-alarm or alarm values, AC unit fail, temperature/humidity out of allowed boundaries, technical security breach and/or error, water under the raised floor, circuit breaker opening/closing, UPS failure, low battery and more. All alarm limits are stored in a Microsoft SQL database and can be edited by the administrator. ICONICS' ScriptWorX™ will execute a batch file that will shut down all equipment in the data center in emergency situations, such as a very high temperature alarm or a very low UPS battery alarm.

According to STSI - Integrated Technical Services, the HMI/SCADA system is highly user- and administrator-friendly. Operators can supervise all major and critical situations, as well as choose among active objects (UPS devices, air conditioners, branching cabinets, etc.). The system has also proved to aid in maintenance of the datacenter. For instance, one can see the current consumption on each branch by opening a specific power cabinet, but can simultaneously open the specific Veris Industries Device and see any alarm conditions.

Air Conditioner Monitoring Screen in an Example Alarm Condition

UPS Overview Screen

Conclusion

STSI - Integrated Technical Services is satisfied with its ICONICS solutions, helping to provide real-time supervision and control of all devices and environmental parameters (security, power supply, temperature, humidity, etc.) within its new datacenter.

Transneft Russian Pipeline
Moscow, Russia

Bill Gates Presenting the Windows World Open Award

Main Screen Overview of Transneft Russian Pipeline

> *"Transneft selected ICONICS GENESIS32 software suite of products due to its open data-mining and OPC-to-the-Core technology."*
>
> **Transneft**

About Transneft
Transneft, a joint stock Russian Oil transport company and Russia's largest oil pipeline company, manages the world's largest oil pipeline in the world. The pipeline extends from Siberia to the Baltics, and encompasses over 48,000 miles (80,000 km) of oil pipes transporting 420 million tons of oil a year through severe environments. The installation project involved installing over 400 pumping stations and 1,000 holding tanks in 101 locations supplying 35 refineries.

ICONICS Software Deployed
Transneft selected ICONICS GENESIS32™ with GraphWorX™32, TrendWorX™32 and AlarmWorX™32. This suite of software tools is running on over 500 networked PCs, monitoring over 800,000 tags. This is the world's largest PC-based SCADA and dispatch system. The application has won Microsoft's "Windows World Open" Award.

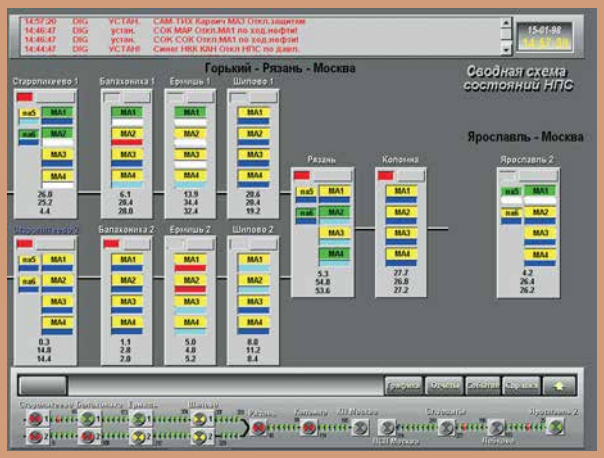
Key Features
The ICONICS GENESIS32 system was installed by the systems integration company, Elesy. With over 500 employees, Elesy is a developer and supplier of process control systems for Russian fuel and energy complex enterprises. The software system monitors the operation of 2,100 PLCs, including 400 pumping stations with 1,000 tanks in 101 tank farms. Transneft uses TCP/IP with satellite links to collect and transmit status data.

Project Summary
GENESIS32 software has been deployed to monitor and control the Trans-Russian Oil Pipeline System. Transneft is responsible for transporting 99.5% of all the oil used in Russia. The system supplies 35 different refineries with their daily crude oil and provides both Europe and China with oil products.

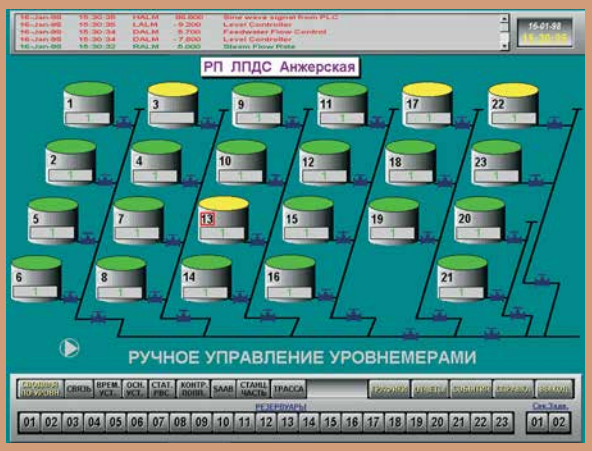
ICONICS GENESIS32 software is monitoring the 400 pumping stations, as well as 1,000 large oil tanks in 100 different tank farms along the extensive pipeline. To provide the centralized dispatch and SCADA system for this project, Transneft is using 500 ordinary P733 PCs running Microsoft Windows NT and Windows 2000. There are approximately 800,000 digital and analog tags communicating over microwave, land telephone lines and 22 satellite links using standard TCP/IP protocol. The 2,100 operator screens required to operate the pipeline have an average response time from any point in the system from between three to five seconds.

Conclusion

ICONICS has worked closely and successfully with Transneft and Elesy to make this Oil Pipeline management project successful in every aspect. Transneft participates in the ICONICS Large End-User Support and Maintenance program to keep their software updated.



Pump Monitoring and Control at Transneft Russian Pipeline



Tank Farm Overview Screen

The system is using ICONICS GENESIS32 HMI/SCADA software, off the shelf PC automation technology, 2000 PLCs and Microsoft Windows NT, 2000 and XP operating systems. GENESIS32 is Web-enabled and its thin client/server architecture integrates seamlessly with Intranet- and Internet-based large network applications.

Benefits of the System

The primary benefit that Transneft has had with the installed ICONICS GENESIS32 system is the substantial reduction in time in leakage detection and the dispatching of a repair solution.

Solutions Highlighted

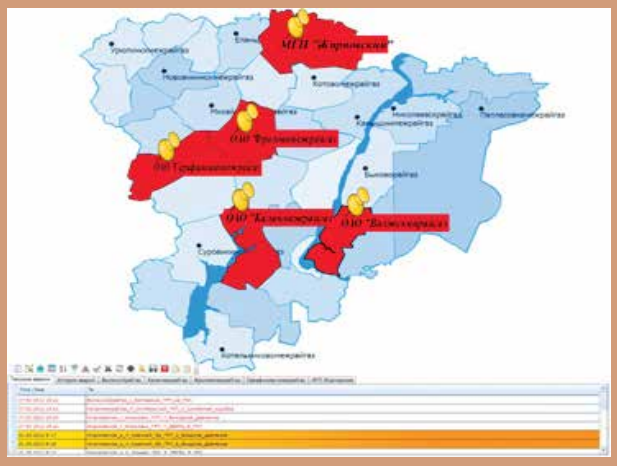
GraphWorX
HMI Graphical Display Package

TrendWorX
Data Logging, Charting and Reporting Software

AlarmWorX
Multimedia OPC Alarm Management Software

Volgogradoblgaz OJSC Plant

Volgogradoblgaz OJSC
Volgograd, Russia



Map of Volgogradoblgaz Region

> *"ICONICS' GENESIS64 software is easy to use and intuitive to interface with."*
>
> **Volgogradoblgaz OJSC**

About Volgogradoblgaz OJSC

Volgograd, Russia (formerly known as Stalingrad) is situated on the Western bank of the scenic Volga River. Modern-day Volgograd is an important industrial city with oil-refining and ship building, as well as steel and aluminum production.

Volgogradoblgaz OJSC transports natural gas from gas pipelines to the population as well as to industrial and municipal enterprises. The development of the gas distribution system in the region has greatly changed over the last few years with the implementation of new technologies regarding maintenance, repair and pipeline rehabilitation techniques. Standard upkeep for such facilities in the gas distribution infrastructure includes portable and fixed gas detectors, sensors, gas line connectors, gauges, the inspection and repair of domestic gas meters, and general maintenance and repair of industrial counters. Add to this the harsh climate and weather Volgograd experiences and regular maintenance can turn into anything but. Wanting to upgrade their facilities to cutting edge Oil & Gas technology, Volgogradoblgaz OJSC began the search for a solution that could help.

ICONICS Software Deployed

Initially, an investigation was started to diagnose exactly what solutions the company should implement. Replacing the TraceMode system that Adastra Research Group had previously installed, Volgogradoblgaz OJSC chose the ICONICS 64-bit GENESIS64™ HMI/SCADA software suite to manage their transfers of natural gas to consumers across the Volgograd region. Their selection included GraphWorX64™, TrendWorX™64 Logger, AlarmWorX™64 Server, AlarmWorX™64 Logger, the Unified Data Manager, ICONICS OPC Server Suite, and WebHMI™. They also paired Microsoft SQL Server 2008 and Office 2008 with the ICONICS system.

Project Summary

Volgogradoblgaz OJSC recognized that, in order to move forward with the modernization of their facilities, they would need a top shelf, trustworthy sys-

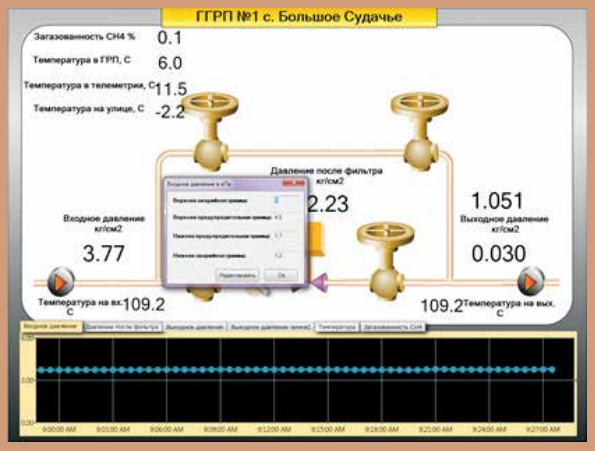
tem that could increase energy efficiency and overall plant manageability. When the company implemented ICONICS GENESIS64, with the help of system integrator Sultanov Ilya V., they decided this was exactly what they needed. The project was implemented by just one person and ran smoothly throughout the six-month integration period, along with studies and performance tests. Subsystem control and data acquisition came from the ICONICS OPC Server, run through the Modbus TCP/ IP VPN protocol. This data is then distributed through ICONICS WebHMI interface.

nating contingencies. Thankfully, with the precision that Volgogradoblgaz OJSC came to expect from ICONICS, the GENESIS64 software suite met each of the goals laid out at the project's start.

Conclusion

Currently, ICONICS products monitor 46 sites for Volgogradoblgaz OJSC, and the commissioning of new facilities, including more than 300 new objects, is already underway. Several plans include commissioning the plant design to include cathodic protection, receive operational data for the

Monitoring using Smart Pins



Flow Monitoring and Control

Benefits of the System

Using the ICONICS solution, the Volgogradoblgaz system has improved significantly in their remote gas facilities' prompt incident response and in emergency situations. It is now possible to utilize extensive analytical data on work sites. Due to construction of the system on a client server via a Web interface, there is no need to install software or have a complicated setup. GENESIS64 allows the company to quickly deploy and operate control towers and dispatch commands remotely. They are able to view facility control and management over the Internet via mobile phones and tablet PCs. ICONICS' ability to plug into existing Phoenix Contact PLCs and Wonderware systems helped keep project costs to a minimum.

ICONICS software also allows for access to data while on site, using a tablet or laptop, while eliminating the gas, reporting, sustainable maintenance management and repairs and more. Volgogradoblgaz OJSC looks forward to working with ICONICS again to create a system of facilities that save engineering and operator time and increase KPIs, as well as increase energy efficiency, plant manageability, and overall plant efficiency.

With the introduction of ICONICS' solution, Volgogradoblgaz OJSC achieved their goals of installing a 64-bit operational system that could handle multiple rooms, pipelines, tanks and other assets while tracking 70 deployed objects (Gas Distribution points, Gas Control points), 3000 tags and 10 regional dispatch control centers. In 2014, Volgogradoblgaz OJSC plans an extension for another 200 objects and up to 10.000 tags.

"We are very pleased with the ease of use and wide accessibility that ICONICS software provides. The technical support has also been absolutely outstanding."

Robert Kelley
Chemistry Supervisor
Ameren

POWER & ENERGY MANAGEMENT, UTILITIES

AES Wind Generation
Palm Springs, California

AES Wind Generation at the Mountain View IV Wind Energy Project

An AES Turbine Screen, Built with GENESIS64

About AES Wind Generation

AES is an international power company located in North Palm Springs, California and specializes in power generation, utilities and renewable energy. Dedicated to providing cleaner and more sustainable ways to create energy, AES invests in hydro, wind, solar, biomass generation and carbon offsets as alternatives to traditional fossil fuels. AES Wind Generation, a special division of AES, explores worldwide opportunities for wind energy creation based on more than 25 years experience in the power industry. They currently manage over 1,700 megawatts of wind capacity across the US and Europe.

In 2010, AES Wind Generation initialized a 49 turbine (one megawatt each) wind farm as part of the Mountain View IV Wind Energy Project and began searching for a dependable SCADA and alarming system to operate it.

ICONICS Software Deployed

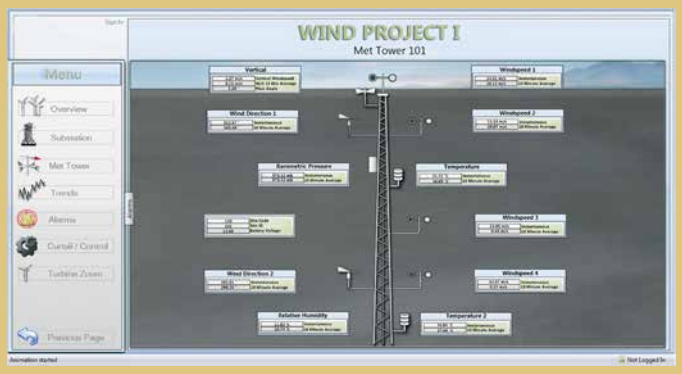
With the 49 wind turbines (built by Mitsubishi Heavy Industries) running, generating a megawatt of energy each, AES understood that they needed a robust system that could perform calculations in real time from both user input and data coming from the field. The Energy industry is primarily concerned with the status of the units as an availability measurement, as well as validating the amount of energy produced versus the amount of energy predicted by the manufacturer's published power curve. After an exhaustive search for which software was the best fit, AES found in ICONICS GENESIS64™ and Hyper Historian™ a complete SCADA and Data Historian solution that would connect via open standard protocols (including OPC) and provide both instantaneous and aggregate data for monitoring and reporting.

Project Summary

Wind farms, in general, can be time-consuming to implement due to the high amount of repetition involved with each unit having identical inputs and outputs. The global aliasing functions in ICONICS software gave AES a great advantage in quickly implementing the 49 turbines, once the first turbine was configured. AES brought all the data sources into OPC via various interfaces, such as the Modbus/TCP so the SCADA suite has a standard source of data. They also commissioned an OPC server to be built by Matrikon to convert the MHI CNET protocol into OPC. AES wanted something that was not directly programmed to the turbine protocol, so the turbine data process and the monitoring process could be changed out independently.

Additionally, the HMI interface needed to be delivered without software installation on the client computers and without authorization issues outside of the portal itself. In other words, AES would not need to share the NT authorization outside of their domain, but control users could still access the control functions of the SCADA system. AES also wanted a system that would fit into a virtual machine environment to facilitate backup and recovery should they experience a hardware or software failure. The graphics tools available as a Windows Presentation Foundation (WPF) client were ahead of all of the competition and gave AES the ability to publish a best-in-class interface from an aesthetic perspective.

An Overview, with Alarming, of the Wind Farm



Display of All Data Acquired by a Met Tower

ICONICS' Hyper Historian maintains all data from the turbines at the wind farm as well as overall production data and substation parameters. The ICONICS Universal Data Management, part of GENESIS64 Platform Services, is used to create numerous calculations that feed Hyper Historian and other applications.

Benefits of the System

AES was looking to provide monitoring and control to operators from both AES and MHI, as well as supply aggregate data for their reporting systems. Using ICONICS, AES met these goals and kept development costs to a minimum as they didn't have to use a third party whenever a change was required. For example, they added an indication for low wind speeds at the turbine controller and integrated this into the SCADA system shortly after the park was put online. This would have been a substantial cost if they had gone back to a developer, but AES was able to quickly and cheaply bring the new indication into the monitoring system without additional costs.

Conclusion

Using approximately 30 points per turbine (plus 300 digital points), and another 100 points from the substation (plus 100 digital alarms and statuses), Hyper Historian indirectly attaches to:

- CNET interface of the MHI MRC (turbine controller)
- CR1000 data logger for meteorological data
- DVAR system (Modbus)
- SEL 3530 (real time automation controller functioning as a data concentrator)

ICONICS' system gives AES the ability to centrally manage a data delivery system that is available to all users via a Web interface, without installing software on the client computer. It also allows them to keep the system completely in-house, with no future dependency on third-party development or integrators. AES expects this to provide considerable cost savings as they accommodate changes in both turbine controller logic and shifting operating systems and hardware available in the future. With this in mind, Greg Howard, AES' Systems Integration Manager, said, "We are pleased with ICONICS' ability to provide a solution that can be built, maintained and controlled without paying consultants at every turn."

Ameren's Callaway Nuclear Power Plant
Fulton, Missouri

Ameren
Callaway Plant
Fulton, Missouri

Plant Control Room at Ameren Callaway Facility

> *"We are very pleased with the ease of use and wide accessibility that ICONICS software provides. The technical support has also been absolutely outstanding."*
>
> **Robert Kelley**
> Chemistry Supervisor
> Ameren

About Ameren

Ameren, Missouri's largest electric utility, provides energy services to approximately 1.2 million customers across central and eastern Missouri, including the greater St. Louis area. Ameren serves 65 Missouri counties and 500 towns. More than half (55 percent) of Ameren's electric customers are located in the St. Louis metropolitan area. Its Callaway Nuclear Power Plant in Fulton has an 1,100 megawatt capacity.

ICONICS Software Deployed

Ameren uses ICONICS' GENESIS32™ Enterprise Edition HMI/SCADA application, WebHMI™, a Web-based, real-time automation software, and the AlarmWorX™32 distributed enterprise-wide alarm and events management system.

Project Summary

Ameren needed a replacement for a legacy solution no longer supported after the year 2000. After careful consideration and evaluation, ICONICS GENESIS32 was selected. GENESIS32 is currently used to provide remote access to inline chemistry analyzer readings (both numerical output and trend graphs). AlarmWorX™32 provides paging alerts to alarm conditions. Currently, all the databases and ICONICS applications are accessible from a single Web page. This removed the database from the plant mainframe (supporting a plant goal of eliminating the mainframe). It also allows for access of live chemistry data to all plant personnel. Prior to this, live chemistry data was only accessible on a few PCs that had the legacy software installed.

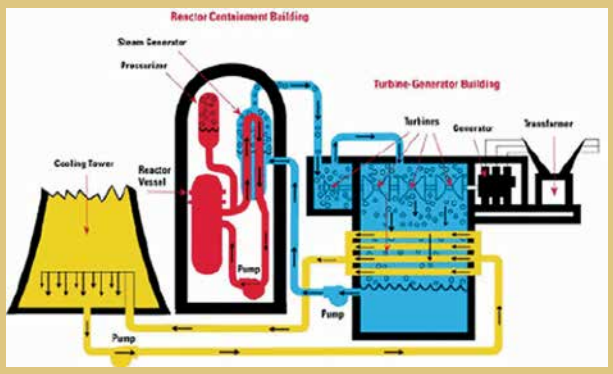
Key Features

In replacing the existing system, Ameren sought specific features for their HMI/SCADA solution, including:

- Access of live data to all personnel on site
- Pager alarm notification to technicians
- Remote accessibility
- Single Web page views

Conclusion

Set on its mission of providing energy to its million-plus customers, Ameren and its Callaway Plant needed a partner to meet its HMI/SCADA needs quickly, seamlessly, and cost-effectively. ICONICS, with its award-winning GENESIS32, fulfilled those needs, fulfilling its promise of "Web automation at your fingertips".



Plant Facility Layout

Operators at Refueling Machine Controls

Benefits of the System

The implementation of ICONICS GENESIS32 system has furthered Ameren employees' access and use of its chemistry data. ICONICS had previously been known to Ameren solely for its AlarmWorX software. GENESIS32 has met the utility's expectations to the point where they are interested in the suite's expanding capabilities. Integration with Ameren's existing systems, including Honeywell Micromax2 controls and Microsoft applications (Windows 2000, Windows 2000 Server, Office 2000, SQL, Access), is seamless. Freed from the mainframe thanks to ICONICS WebHMI, Ameren's chemistry technicians are now able to maintain the system remotely.

Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

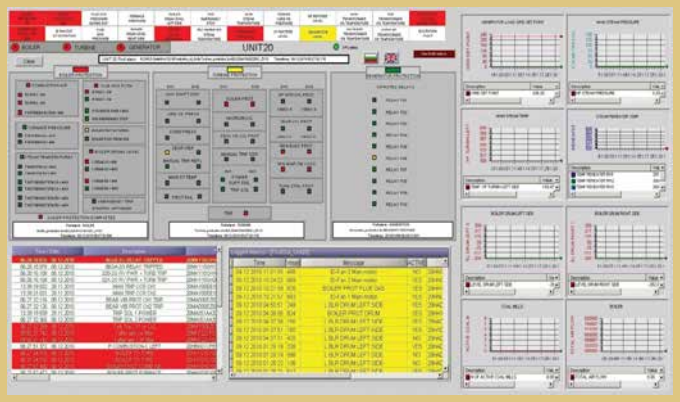
WebHMI
Web-Based Real-Time Automation Software

AlarmWorX
Multimedia OPC Alarm Management Software

ContourGlobal Maritsa East 3 Thermal Power Plant

Stara Zagora, Bulgaria

Maritsa East 3 Thermal Power Plants
Stara Zagora, Bulgaria



UNIT 20 – "First Out" Function Screen

About ContourGlobal Maritsa East 3 Thermal Power Plant / EXBIT Ltd.

Since 2011 Maritsa East 3 Thermal Power Plant (TPP) has been owned by ContourGlobal. It is the third largest power plant in Bulgaria, generates 30 percent of the country's electricity and is one of four power plants that makeup the Maritsa East Energy Complex. The lignite-fueled plant supplies electricity grids in both Turkey and Bulgaria. Built by Russia between 1978 and 1981, the plant connects to grids through substations across the region.

EXBIT Ltd. is ICONICS' system integrator partner with a focus on industrial automation engineering—research, design, scheduling and project commissioning of automation control systems, configuration and application programming of PLC and SCADA systems.

ICONICS Software Deployed

Maritsa East 3 TPP selected ICONICS GENESIS32™ software. EXBIT implemented GraphWorX™32, TrendWorX™32, GenBroker™, DataWorX™32, WebHMI™ for Web-based real-time automation, AlarmWorX™32 Multimedia for real-time and SMS alarm notifications. ReportWorX™ is being used to generate reports. They also chose OPC standard servers. ScriptWorX™ is being used to realize more special functions of system monitoring.

Project Summary

Since February 2009 the power plant completed a vast and complex project for rehabilitation and modernization, which turned the 30-year old facility into an environmental and safety leader and is the most reliable power producer in the country.

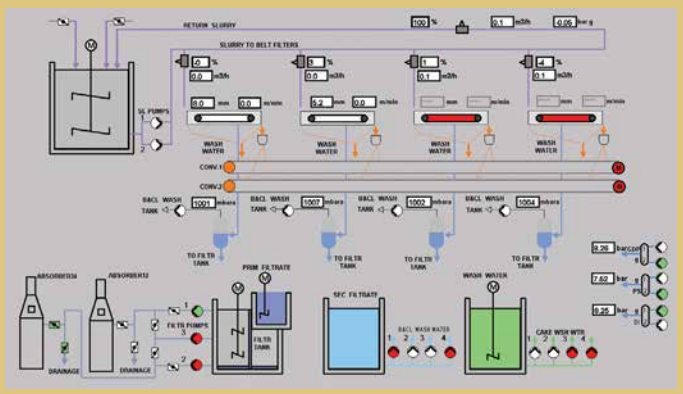
The objectives for the Maritsa East 3 TPP project included large-scale modernization and upgrades, an increase in output and power capacity and meeting the European ecological requirements. The final part of the project was the integration of all control systems on a single platform. EXBIT was chosen as the developer and system integrator for the Control and Monitoring Integration System.

To meet their objectives, EXBIT created centralized data access from all of their OPC servers, with more than 8,000 tags, utilizing DataWorX32, an OPC data integration solution. This provided data tunneling, aggregation and redundancy, as well as the ability to access the data from all applications, including a PI historian system, for plant control.

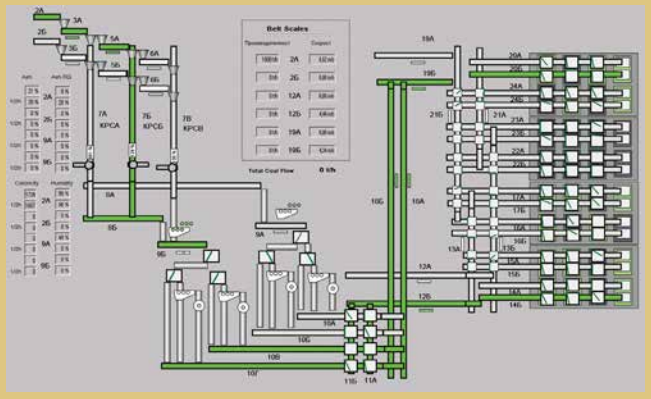
For visualization, EXBIT created graphical screens on which data is shown through dynamic GENESIS32 displays. These displays allow visualization of the main control system, Siemens DCS SPPA-T2000, and all of the plant's sub-systems. Displays, alarms and trends are exhibited on wall-mounted displays in the control centers. Dedicated trend screens show the start profiles and the designation of different startup modes of the plant boilers. Plant management is able to access and manage all of the data through the office network or with VPN access.

Benefits of the System

Thanks to the upgrade, the ContourGlobal Maritsa East 3 TPP is now an environmental leader in Bulgaria and is fully compliant with all of the European Environmental standards, including certification under ISO 14001:2004 and OHSAS 18001:2007. Additionally, the plant's output has increased significantly from 840 MW to 908 MW. Plant project objectives were all reached after the complete implementation of ICONICS software. The management and operating staff now have visibility and full access to their plant's process data, and are alerted, in real time, of any issues.



Gypsum Dewatering Screen



Coal Handing Screen

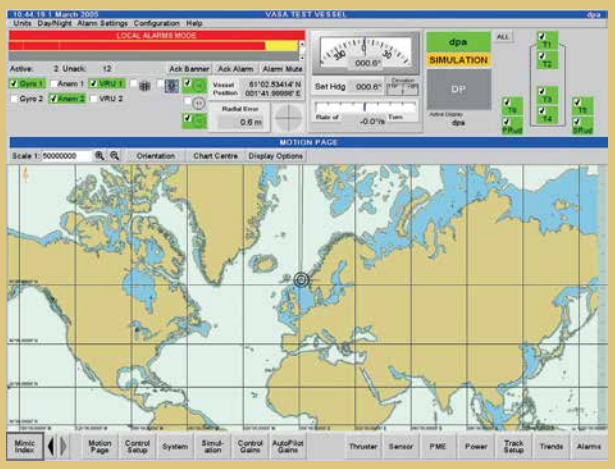
A WebHMI server was implemented to allow for remote access, via the internet, on thin Web clients, which allows personnel to visualize processes without the installation of any other software. Alarms from generator relay protection logic are being integrated and diagnosed using gateway controllers developed by LOGISOFT—a subcontractor of EXBIT. The DCS alarms are being managed with a "first out" function for analysis, including the relay protections in real-time with specialized scripts developed by EXBIT using ScriptWorX. Alarms are sorted by time stamp, even within milliseconds in the case of trip events. AlarmWorX32 Multimedia was specifically selected for its ability to send alarm status notifications to mobile devices.

Conclusion

The ContourGlobal Maritsa East 3 Thermal Power Plant aimed to become more energy efficient and through the implementation of ICONICS software, they have achieved this. Complete real time monitoring and alerting allow the plant to be well managed and continue to increase production and productivity.

Converteam
Rugby, United Kingdom

Part of the LNG Fleet



HMI Day View

> *"In selecting ICONICS' GENESIS32 for our offshore applications, Converteam focused upon OPC connectivity to ensure that this standard would allow on-going flexibility in the choice and development of controllers in the future. Equally important was the capability to develop well tested modular solutions that could be re-deployed according to the project's particular requirements."*
>
> **Gerry Palmer**
> Converteam Software Section Leader
> PC Products & Tools

About Converteam

Converteam is a leading supplier of power conversion engineering. Providing customized solutions to convert electrical energy through physical equipment such as motors, generators, and drives, Converteam also manufactures automation and process controls. Serving the Marine, Oil & Gas, Energy and Manufacturing industries, Converteam's services are applied internationally.

Converteam's solution for the marine and offshore industry includes the C-Series Vessel Control System (VCS) which combines ship-wide supervisory control and monitoring together in a single system, enabling operators a complete overview of all ship systems.

Converteam recently selected ICONICS for automation, SCADA and HMI in a fleet of LNG tankers and ships designed to transport liquefied natural gas.

ICONICS Software Deployed

ICONICS' GENESIS32 is the standard HMI for Converteam's C-Series Vessel Control System. This decision was made by comparison of several other HMI systems that failed in key areas of extensibility, modularity, flexibility and connectivity.

Key Features

In marine and offshore applications (both commercial and naval), HMI faces unique issues. HMI displays located on the bridge must comply with standards and regulations concerning night vision and other safety measures. Aboard ships where Converteam's C-Series VCS is implemented, ICONICS' GENESIS32 screens have three modes to enable the bridge crew better external observation: one for daylight, one for dusk and dawn, and one for night. GENESIS32 screens further

ensure safety and convenience with touch-screen drivers and oversized symbols for "finger-sized" use.

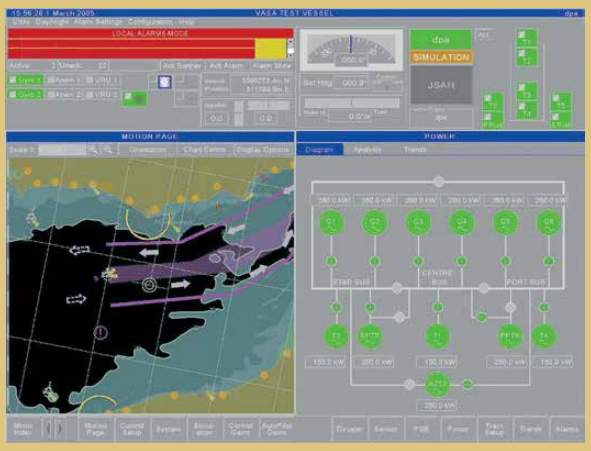
Project Summary

Converteam has special and proven systems for all aspects of data acquisition and control in the offshore environment. Systems are integrated with control rooms and the ship's bridge according to their functionality. All HMI communication is executed through OPC links to an OPC Server. ICONICS' GENESIS32 receives all information through this server and commands are issued in a similar manner.

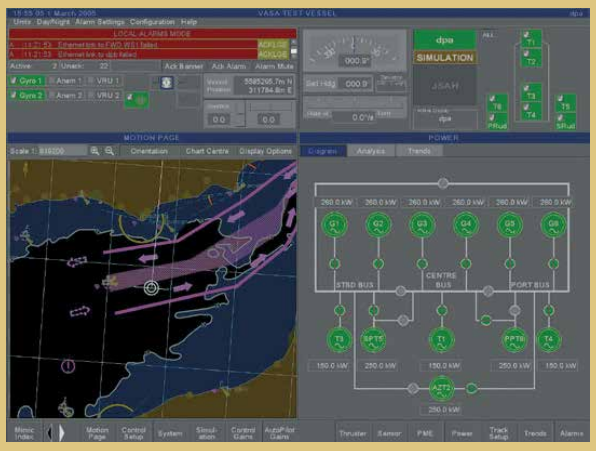
regulations surrounding the use of software control on vessels include a requirement that displays must appear on request, within two seconds. ICONICS and Converteam easily comply with this requirement.

Benefits of the System

The recently completed LNG fleet for a major UK energy company used a large control and monitoring system with over 750k HMI tags, 220k of alarms & events and 5,600 system I/Os. The modularity within GENESIS32™ allows for proven control objects to be deployed to reduce engineering time and greatly



Dusk View



Night View

The integrity of ship control is very high, thus all commands issued through the screens are acknowledged and fed back to the display for operator confirmation to ensure that a command has been executed properly.

Alarms and trending, important to ship operation, are available at any time to be displayed and zoomed in on to provide detail for problem diagnosis and fault avoidance. Additionally, alarms and other data are stored historically in separate databases providing complete audit-trails of actions. Data historian workstations, where a PC provides black box logging, can record Vessel Control System, Dynamic Positioning signal parameters and Alarms/Events for long periods of time.

ICONICS-powered workstation displays are found in many areas of the ship's systems, especially on the bridge where Dynamic Positioning is used. The standards and

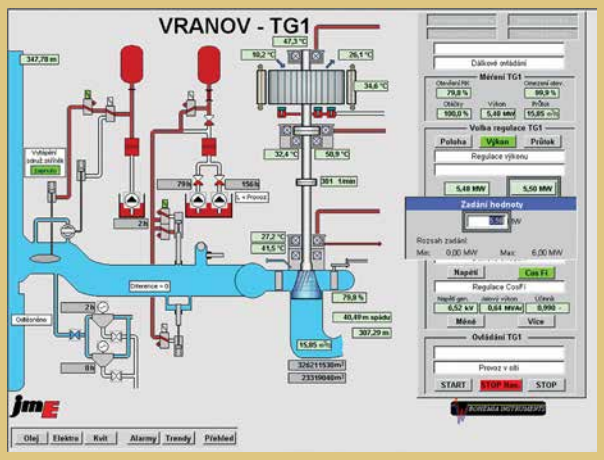
improve project development quality, with fewer errors, delivering benefits in testing and commissioning. After only three days of training, an experienced control engineer became sufficiently conversant with GENESIS32. The availability of complete information behind each screen symbol allows instant access to all information at any point in the development and integration process.

Conclusion

ICONICS' GENESIS32 is the long-term solution for the LNG fleet with a 25-year projected working life. This includes provisions for backwards compatibility, upgrades, portability and other whole-life cost issues. ICONICS is on board with meeting the specialized needs of Converteam's marine and offshore clients.

E.ON Trend s.r.o.
České Budějovice, Czech Republic

Hydro Turbines
E.ON Hydro Power Station



Turbine Monitoring Screen at E.ON

"This application using GENESIS32™ and integrated by Bohemia Instruments created the ability to centrally control our hydro-powered electrical plants, and made production planning and historical data archiving very easy. The new system will reduce the service calls to remote locations, thereby reducing our operating cost."

Stanislav Cupr
Manager of Water Hydro Operating Controls
E.ON Trend s.r.o.

About E.ON Trend s.r.o.

As a world-wide power and gas company, E.ON is based in Germany with subsidiaries throughout Europe, Russia and North America.
Within E.ON's energy group in the Czech Republic, E.ON Trend s.r.o. is responsible for electricity generation and heat production and distribution mainly for households.
ICONICS provides a visualization and automation solution to six of E.ON's hydro-powered electrical plants in the Czech Republic. With a total output of 30 MW, the hydro power stations are monitored and controlled by a central control station up to 100km away.

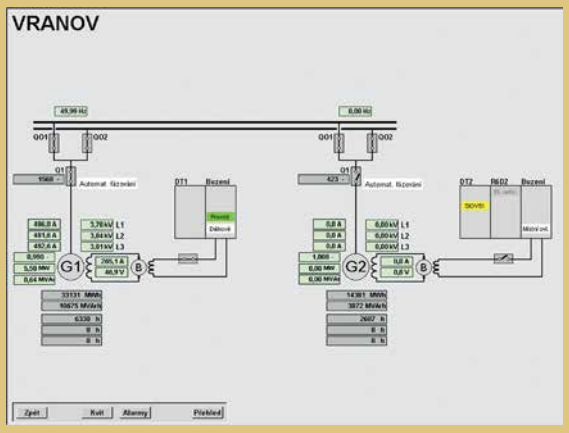
ICONICS Software Deployed

GENESIS32™ V9 is used in a redundant fashion with multiple operator stations. AlarmWorX™32, GraphWorX™32, TrendWorX™32, ScriptWorX™32, and DataWorX™32 are all used to bring this application together.
E.ON management takes advantage of native remote access via WebHMI™. The SOAP/XML communication protocol was used to meet E.ON's strict IT security policies.
Bohemia Instruments a.s., later Invelt - elektro s.r.o., in Plzen, Czech Republic, were the system integrators at the helm in getting the E.ON project up and running. Invelt integrated the remote plants and brought all data to one central command center in only six months time.

Key Features

Data is communicated to the central command center via E.ON's optical network. GENESIS32 works as a data acquisition and logger for all turbines. At the core of the system, two GENESIS32 servers work redundantly with DataWorX32. OPC servers are used for gathering the data from SAIA PLCs. GENESIS32 is responsible for the monitoring, alarming and supervisory control for over 5,000 analog and digital points. The custom graphic screens allow operators to monitor all locations and drill into problems requiring attention quickly and easily. Alarms can be acknowledged and logged, and set-point changes can be made in a secure and accurate manner. The command center was designed with four GENESIS32 operator stations connected to the pair of redundant GENESIS32 application servers.

An E.ON Hydroelectric Power Plant



GraphWorX32 Screen for Planning E.ON's Energy Production

Project Summary

DataWorX32 plays a critical role in this application by providing real-time OPC redundancy to keep E.ON power plants up and running. ICONICS was selected for this project due to its ability to provide this needed level of redundancy. When E.ON was looking for a solution to replace the Promotic Microsys system, their requirements were data redundancy, real-time alarm notification and superior graphics. E.ON had a need to centrally monitor and control their remote hydro power plants, and also be able to bring all power generation together.

With over 5,000 I/O points monitored and logged from multiple locations, GENESIS32 is the perfect fit. E.ON's output is 30 MW spread over the remote hydro plants throughout the Czech Republic. All turbines are monitored and controlled from the central command center, and data is logged in real time and passed to the central command center.

Conclusion

ICONICS and Invelt have worked closely with E.ON to make this project a success. E.ON realized savings with the ability to react to potential problems in real-time. With ICONICS, E.ON reduces their trips to remote generation plants, and is enabled by centralized data collection.

Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

TrendWorX32
Data Logging, Charting and Reporting Software

Microgy's Digester Equipment

Environmental Power Corporation (Microgy)
United States

Microgy's Huckabay Ridge Facility in Texas

"ICONICS WebHMI™ provided a tangible, competitive advantage due to its efficient use of bandwidth. Efficient data transfer was critical as the sites were located in remote areas only accessible via satellite technology."

Michael Norman
Operations Manager
Wunderlich-Malec Engineering

About Microgy

Microgy, a subsidiary of Environmental Power Corporation, develops facilities to efficiently and reliably produce clean, renewable gas from agriculture and food industry wastes. Through anaerobic digestion, where methane-rich biogas is extracted from waste to produce electric power, Microgy helps farms and businesses responsibly manage the wastes they generate.

Biogas production through manure digester technology not only renders fuel used in a variety of applications; it reduces manure odor and creates significant quantities of marketable carbon credits. Biogas is utilized in internal combustion engines to generate electric power and heat, used as-is to offset fossil fuels, or is captured and further refined to pipeline quality Renewable Natural Gas. Considered "carbon neutral," RNG® is purchased by customers to address various renewable energy portfolio requirements and reduce carbon emissions.

Since 1982, Environmental Power Corporation has contributed to environmentally responsible energy operations, owning and operating hydroelectric plants, municipal waste projects, coal-fired generating facilities, clean gas generation and energy recovery facilities.

ICONICS Software Deployed

GENESIS32™, along with GraphWorX™, TrendWorX™, AlarmWorX™ are used to monitor and control systems at Microgy's facilities. AlarmWorX MMX provides paging for alarms. At Microgy's corporate level, ICONICS' WebHMI™ provides internal access and visibility to all sites.

Project Summary

ICONICS automation solutions are applied in four of Microgy's renewable energy facilities throughout

the United States' Western and Midwestern regions: Five Star Dairy and Wild Rose Dairy in Wisconsin, Norswiss Dairy in South Dakota, and Huckabay Ridge in Texas. For Microgy's biggest facility, targeted production is enough RNG to heat over 13,500 homes annually.

A typical Microgy facility is comprised of a manure mix tank, digester vessel, substrate tank, biogas-fired boiler, an internal combustion engine and electric generator that is enclosed in a noise attenuating building, and a small utility substation that steps-up the electricity generated to the same voltage level as the existing electric distribution lines the facility connects to.

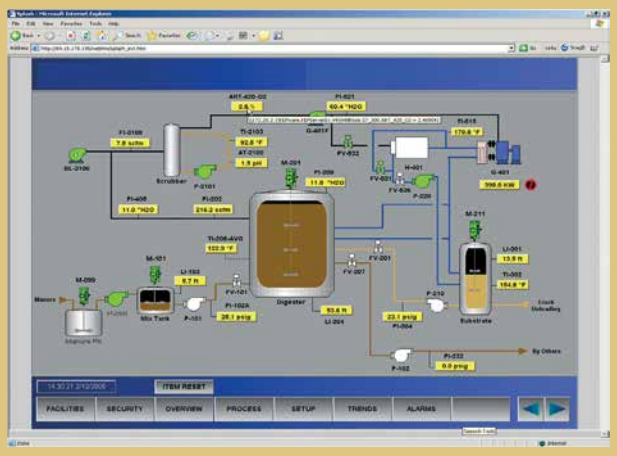
Over the course of three months per facility, Wunderlich-Malec Engineering integrated ICONICS' monitoring and control systems. Wunderlich-Malec's control design from the instrument level combined with ICONICS software provides Microgy with real-time monitoring and control, on a 24-hour basis with historical data collection. The control system is designed to provide automatic operation of all systems components with built-in fail to safe modes in the event of an upset.

Data is conveyed from remote locations to a corporate location in Tarrytown, New York via WebHMI, providing data collection, batch-transfer, and trending from all sites.

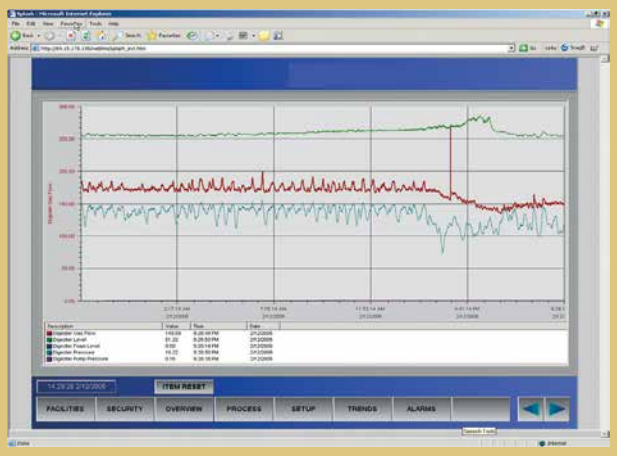
Benefits of the System

Visualization solutions for Microgy's sites required satellite connectivity due to limited Internet access in remote locations. ICONICS' efficient transfer of data was appealing for this reason. When Microgy's sites migrated from satellite to DSL and cable, the switch-over proved to be simple and successful.

Apart from the complete visualization and automation solution, ICONICS provides connection of remote locations to a centralized, corporate location. Complete batch-transfers and access to data is available at the corporate level, allowing decision-makers key insight.



Production Display



Trending for a Microgy Facility

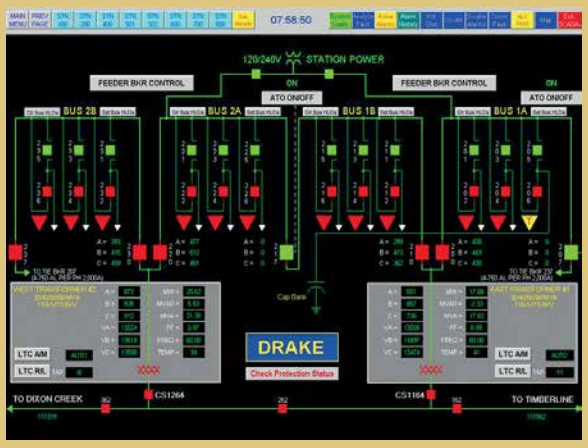
Conclusion

ICONICS and Wunderlich-Malec Engineering have worked to provide Microgy with a complete visualization and automation solution. Enabling Microgy's novel digestion technology assists with animal waste management and generates environmentally responsible energy.

Fort Collins Utilities
Monitored Substation

Fort Collins Utilities
Fort Collins, Colorado

City of Fort Collins
Utilities



Substation Monitoring and Control

About Fort Collins Utilities

Fort Collins, Colorado, located 60 miles north of Denver, is a town of approximately 130,000 residents and is home to Colorado State University. Money magazine named the town the "Best Place to Live" in 2006. The town's electric utility currently serves over 65,000 customers over a 22 square mile service territory. Its five substations have a combined transformer capacity of 600 MVA.

ICONICS Software Deployed

Fort Collins Utilities - Light & Power selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite during recent system upgrades.

Project Summary

Fort Collins Light & Power had a number of specific goals in mind before upgrading its SCADA system. The SCADA software itself needed to support five substations and 2,600 data and control points using OPC communications standards. The HMI would need to interface with multiple applications including system power quality and security, to name a few. Fort Collins also planned to establish a dedicated GIG Ethernet fiber loop to each of its substations, as well as to the utility's Drake Water Reclamation Facility, to provide a high-speed secure data highway for SCADA and future applications such as distribution automation.

The utility also planned upgrades to all substation remote terminal units (RTUs) and power quality meters (involving both hardware and software). Ethernet communications were to be established to all substation devices via TCP/IP, thereby eliminating outdated modem technology, and all SCADA and fiber equipment were to be connected to uninterruptible power supplies. Once the new system was up in running, it would be run in parallel with the old system during 1000 hour acceptance testing. The new system would also share some aspects of the older one so as to minimize in-house training time and costs.

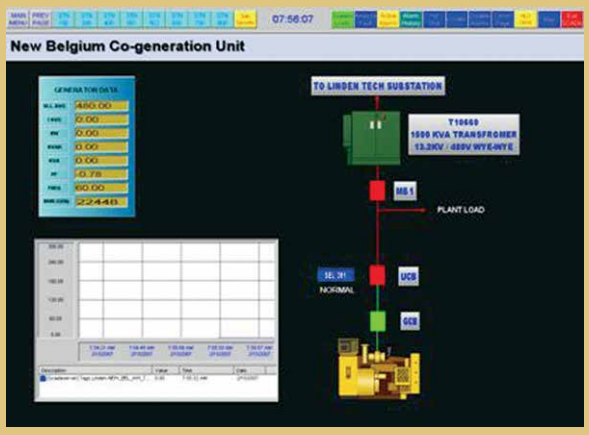
Fort Collins Light & Power required software that they would be able to test before making any purchase decision and that wouldn't require any proprietary custom software drivers or protocols. They had decided to move to the OPC standard to provide

for an easily scalable, proven client/server architecture that can interface to a wide range of intelligent electronic devices, RTUs, PLCs, cameras, etc. An additional requirement was ODBC connectivity to the company's multiple databases, including Microsoft Access, SQL Server and Oracle. The utility's selected HMI component would be counted on to support full graphical automation with instant Edit/Runtime functionality and robust graphical editing, alarm management, trending and data historian abilities.

Benefits of the System

Fort Collins Light & Power saw multiple advantages in upgrading to ICONICS' OPC-based GENESIS32 HMI/SCADA suite, including:

- An HMI solution that can handle multiple uses
- Standard industry OPC architecture, which allows for vendor independent alarm servers, trending, data historians and HMIs
- Flexibility to communicate via multiple protocols using OPC servers



Co-generation Monitoring

Power Quality Event Reporting

Currently, Fort Collins Light & Power utilizes ICONICS' GENESIS32 HMI/SCADA suite to enforce a manual load shedding requirement, allowing the utility to select feeders rather than the G&T utility tripping substation transformers. The new system is also used in proactive power quality event/system disturbance notification via paging or other system alarms. Substation data, controls, security alarms, reference materials and cameras were all incorporated into the single HMI/SCADA solution.

- Capability to easily add functionality
- Scalability from small to large point counts

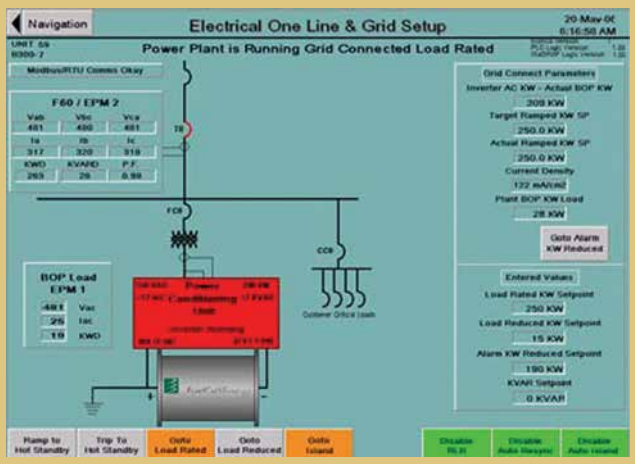
Conclusion

The total cost over time of Fort Collins Light & Power's most recent SCADA system upgrade, which includes ICONICS industrial automation software as well as related hardware, training and development, is comparatively low compared to systems installed in 1979 (later upgraded in 1986) and 1998. ICONICS solutions have proven to be a powerful asset for this utility customer.

FuelCell Energy, Inc.
Danbury, Connecticut

FuelCell Energy DFC 300s on a San Diego, CA Tennis Court

FuelCell Energy
Ultra-Clean, Efficient, Reliable Power



FuelCell Line and Grid Setup Screen

About FuelCell Energy

FuelCell Energy, Inc. is a world leader in the development and manufacturing of high temperature hydrogen fuel cells for ultra-clean electric power generation. The company's patented Direct FuelCell® (DFC®) technology combines high efficiency, ultra-low emissions, simplicity and economical cost for stationary power generation. Their products range in size from 250 kilowatts (kW) to 2.4 megawatts (MW), and are designed for a wide range of customers, including hospitals, universities, hotels, utilities, and wastewater treatment facilities.

The company is also developing next generation high temperature fuel cell products, such as a diesel fueled marine Ship Service Fuel Cell, combined-cycle DFC/Turbine and DFC-ERG™ power plants, and next generation solid oxide fuel cells.

ICONICS Software Deployed

FuelCell Energy, Inc. uses multiple ICONICS solutions in the monitoring and control of their fuel cell products, specifically GENESIS32™ Enterprise Edition HMI/SCADA application; WebHMI™ Web-based, real-time automation software; and the AlarmWorX™32 distributed enterprise-wide alarm and events management system.

Project Summary

FuelCell Energy required a "robust, secure Human Machine Interface" to monitor and allow remote control of the company's power plants as stand-alone systems. They initially worked with a system integrator partner, then customized their resulting solution before finalizing project development on their own.

The current system is comprised of approximately 20 screens for rich, graphical representation of FuelCell Energy's processes (e.g., trending, alarms and historical alarms).

Benefits of the System

ICONICS' GENESIS32 system has provided FuelCell Energy with sought-after alarm management and online functionality. Operators can now be alerted during alarm/event conditions for immediate acknowledgement and action. The Web-enabled HMI fosters ease of use and remote monitoring/control throughout the company.

A further benefit is the ICONICS suite's seamless integration into FuelCell Energy's existing operating

systems (Windows 2000/XP Professional), with features such as data logging into Microsoft SQL Server and MSDE. In addition, the company's GE Fanuc 90-30 controllers are able to communicate directly to GENESIS32 via Kepware OPC servers.

The combination of ICONICS solutions (GENESIS32, WebHMI, and AlarmWorX32) delivers the easy-to-use HMI, Web-based remote access, and alarm/event management that the energy system manufacturer required for remote monitoring/control of its power plants as "standalone" systems.

Solutions Highlighted

WebHMI
Web-Based Real-Time Automation Software

AlarmWorX
Multimedia OPC Alarm Management Software

A DFC300 Installation in Downtown Manhattan

HMI in Action at a FuelCell Energy Inc. Manufacturing Facility

Conclusion

FuelCell Energy has been a satisfied ICONICS customer for over two years, having evaluated GENESIS32, AlarmWorX32, GraphWorX32, and TrendWorX32 as well as additional OPC and WebHMI features in real world applications. They've found that ICONICS is an easy to implement and reliable OPC Web-enabled HMI/SCADA package to use, compared with legacy offerings. The firm plans to continue to employ ICONICS tools for its product line.

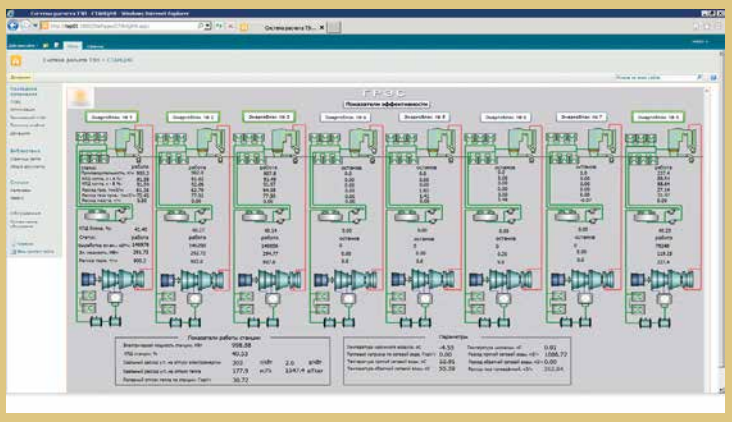
Case Study Details

In creating their HMI, FuelCell Energy had specific guidelines and requirements, including:

- Secure remote connectivity
- Robust system reliability
- Easy maintenance/troubleshooting
- A rich GUI with advanced features
- OPC-based communications
- Standard VBA scripting

Global Energy Generation Firm
Central Russia

Map of Central Russia



Overview HMI Screen

"The use of ICONICS software to calculate excessive fuel consumption, coupled with its presentation of current engineering and economical performance analyses (technical process rates) allows us to identify and determine the reserves of increasing a thermal power plant's efficiency. In the final analysis, this allow thermal power plant owners to optimize their production capacity in order to be competitive in the electricity market, as well as increase energy company profits in general."

About this Global Energy Generation Firm

A recent customer of ICONICS is a large energy generation firm comprised of a network of plants located throughout Central Russia. The largest of the sites is a 2500MW facility that is fueled by a combination of natural gas and fuel oil and consists of four thermal power plants. This location has now been optimized via ICONICS technology.

ICONICS Software Deployed

The Russian energy firm, working with system integrator, RVS, selected ICONICS GENESIS64™ HMI/SCADA, Hyper Historian™ data historian and BizViz™ manufacturing intelligence (including PortalWorX™ real-time collaboration and visualization dashboard and ReportWorX™ enterprise reporting, charting and analysis) software.

Project Summary

The large-scale Russian energy provider has had basic direct digital control (DDC) for many years. Working with its system integrator, RVS, the firm initiated a major optimization effort, with a preference towards utilizing the latest software technology while simultaneously ensuring integration with a wide variety of data sources. The firm sought a solution that could handle the data from four thermal power plant (TPP) production branches (each with approximately 5,000 I/O points) as well as from its executive office.

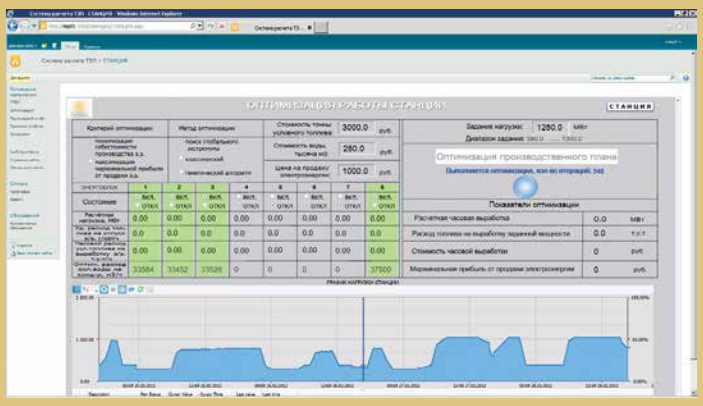
An additional major need of the plant was to provide a uniform, insightful user interface to all operations and levels of management. The company required dashboards that could provide needed insight in order to

drive immediate improvement actions. The site also sought a major upgrade in its reporting capabilities.
Prior to considering this upgrade, a legacy data historian from OSI PI provided limited visualization and report capability, but could not provide the depth of information available.

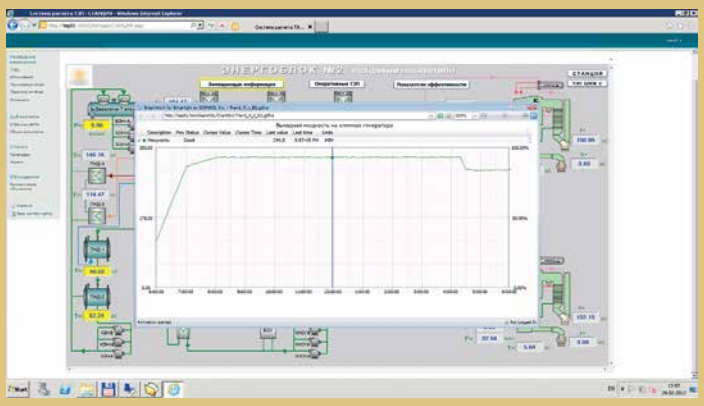
Benefits of the System

Since ICONICS GENESIS64 was selected as its preferred automation software platform, the plant has been able to integrate real-time plant data, legacy historical data, newly recorded data (utilizing ICONICS' powerful Hyper Historian data historian), data from various business systems, and simulation and forecast data generated by MathWorks MatLab® simulation programs.
The need for insightful, intuitive user interfaces was fulfilled via GENESIS64's GraphWorX64™ and TrendWorX64™ components and PortalWorX™ real-time collaborative visualization tools, which helped to create powerful Microsoft SharePoint®-integrated operations dashboards. These solutions help to ensure the delivery of needed information to each role within the organization, supporting necessary decision-making in order to optimize operations. Also, the firm's requirement for enhanced reporting has been accomplished by ReportWorX, which delivers operational reports as well as plant revenue and profit reports.
GENESIS64 provides the Russian energy firm with state-of-the-art process graphics, monitoring and control interfaces needed for uniform operation. Utilizing the extensive array of data sources that can be compiled by the GENESIS64 platform, the energy producer's new automation system is able to produce operational guidance that includes:

- Proposed optimum sequencing of generators and support equipment to achieve planned load dispatch schedules
- Proposed optimum fuel consumption based on current and forecasted fuel costs
- Proposed optimum use and maintenance schedules of all equipment based on daily or monthly forecasts of dispatch demand, due to forecasted weather, forecasted local industrial production, and/or historical demand. ICONICS software allows the firm to use 'current runtime' and other equipment health data and asset reference data to predict uptime and schedule required downtimes
- Continuous transparency of planned, actual and normative power production of each generating unit and of the plant as a whole



Main Dashboard



Trending Screen

Continued on the next page...

- Achieved and Forecasted Next Day, Week and Month plant revenue and profit margin based on all cost factors and spot and projected electricity prices

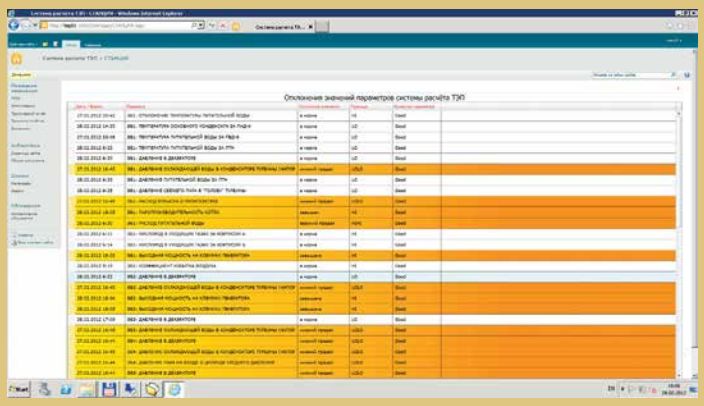
Management at the energy firm notes that the system has increased the ability to better observe processes as well as increased transparency in both operations, and revenue/profit information (both original, estimated and forecasted operational and economic indicators). Operational staff now conduct processes more efficiently due to the introduction of incentive schemes based on operational and economic performance calculated in real time.

Additional results include:

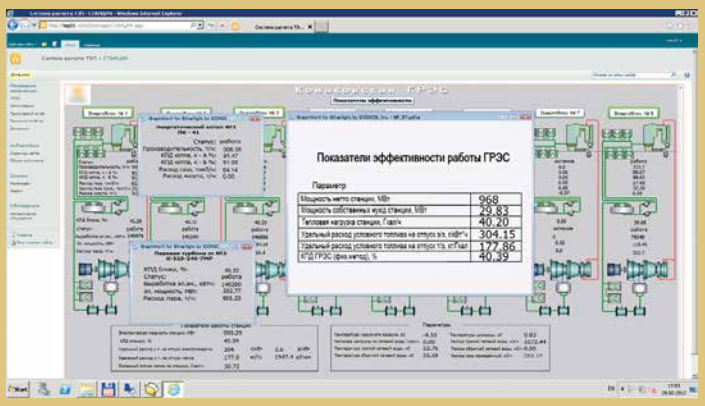
- Short and long-term optimization (setting the optimum choice of equipment and load allocation, economic dispatch and unit commitment)
- Optimized operation of heat stations (which helps maximize profit margin)
- Operating and economic performance prediction calculation
- Calculation of the optimal flow rate of circulating water to the condenser (which helps to reduce environmental costs).

Conclusion

ICONICS GENESIS64, Hyper Historian, BizViz and their components have helped this Russian energy provider transition to cutting edge technology that allows them to build upon their legacy infrastructure and integrate with diverse data sources, thereby ensuring operational integrity.



Alarm Management Screen



Drill-down Information

About RVS

RVS is an engineering company that implements multi-purpose projects aimed at enhancing energy infrastructure efficiency across an enterprise, including processes involving production, transfer, distribution and consumption of energy resources. The company's involvement encompasses the complete project cycle, from analysis and design to technical support of the implemented solutions. RVS provides a complete suite of innovative solutions required for the efficient operation of power facilities including automation systems, the reconstruction of power sites, the increase of energy efficiency and service maintenance of installed systems.

The World's Most Advanced Automation Software

Take Full Control of Your Assets on Any Glass, Anytime™

Are you under pressure to increase production, lower costs, reduce downtime and improve overall quality? ICONICS' GENESIS64™ HMI/SCADA suite achieves operational excellence by delivering actionable information to operators, managers and fields service workers. Monitor and control your data using smartphones, tablets, browsers and Web-enabled devices with MobileHMI™. Benefits of using ICONICS software include:

- Secure insight into production, downtime metrics and trends
- Drill down from any asset to equipment-level details
- Receive role-based KPIs and instant alert notifications
- Stay connected to real-time data any time, anywhere

VISUALIZE | HISTORIZE | MOBILIZE | ANALYZE | CLOUD IoT

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Microsoft Partner of the Year

ICONICS

Make the Invisible Visible™

The Shores of Isle of Man
United Kingdom

Manx Electricity Authority
Isle of Man, United Kingdom

Pulrose Power Station

About Manx Electricity Authority

The Manx Electricity Authority (MEA) in the United Kingdom is responsible for the generation of electricity, controlled from multi-plant facilities, across the Isle of Man. The MEA is also responsible for ensuring full commercial potential of the UK-IOM (Isle of Man) subsea power cable. One of the difficulties faced by the MEA was they found themselves with a proliferation of different SCADA systems. Each operated uniquely; which made it very time constraining and costly to train operators and keep them updated on system changes. Wanting to streamline their efforts, the MEA decided it was time to look for an integrated enterprise-level SCADA solution.

The Manx Electricity Authority decided to turn to ICONICS for a solution after careful evaluation. Mike Newby, Plant Engineering Manager for the MEA stated, “After interviewing a number of independent systems integrators, we decided to utilize ICONICS as the solution provider. We determined that, although not necessarily cheaper, the services that ICONICS could provide would be more consistent and would best use the features available in the GENESIS32™ product.”

ICONICS Software Deployed

Manx Electricity implemented ICONICS GENESIS32, ICONICS GenBroker™ technology, DataWorX™32, GraphWorX™32 and MobileHMI™ to work towards a solution.

Project Summary

As part of this integration, a design project was kicked off as a pre-requisite to the implementation which aimed to define a set of display templates and common symbols. This requirement meant that the integration team would have to gain a deep understanding of the operations of all the underlying SCADA applications and create a unified set of symbols that would allow the operators to understand and control all of the plant through a single and consistent user interface.

The implementation began by using ICONICS GENESIS32 software to host a pair of redundant servers at each of the key sites. ICONICS software provided a consistent and uniform interface that could be spread across three monitors allowing a single operator, in one control workstation, to manage and control the entire island’s generating capacity. ICONICS GenBroker-technology allowed the MEA

to set up a remote connection to the Isle of Man from ICONICS' offices in Dudley to test the installation, ensuring zero lag time in program commencement. This allowed the project team to test the symbols and displays in real time without having to make many costly trips to the MEA. This strategy meant that the on-site commissioning and testing time of the project was greatly reduced since the majority of the data was pre-tested. ICONICS DataWorX was used as an intermediate layer for the SCADA and provided the translation logic between the various underlying control systems and visualization. In all, the solution currently contains 75,000 data points across the island and is capable of scaling way beyond this in the future.

A new addition to the Manx Electricity Authority story is how the implementation of ICONICS MobileHMI drastically enhanced their plant manageability. MobileHMI is a Windows Phone application that pairs with ICONICS GraphWorX32 to monitor plant outputs and alarms. Once alarms are set based on selected data points, MobileHMI can send push notifications to the operator's Windows Phone in the form of an SMS or text message with details on particular asset levels, alarm severity, and other vital information. This new technology allows operators to monitor plants remotely while still receiving vital operational details.

Benefits of the System

With power stations located at Peel, Pulrose, and Ramsey, and with critical gas infrastructures located at Glen Mooar with a variety of DCS and PLC-based control systems, the MEA decided to look for an integrated enterprise-level SCADA solution with the following requirements:

- Integration of MEA's entire key infrastructure across multiple sites
- Easy expansion for future capacity
- A seamless switchover with parallel running capability of the old SCADA applications as a backup
- Commissioning and testing completed during the annual plant shutdown week before the Manx TT road races

An Operator at the Multi-monitor Control Station

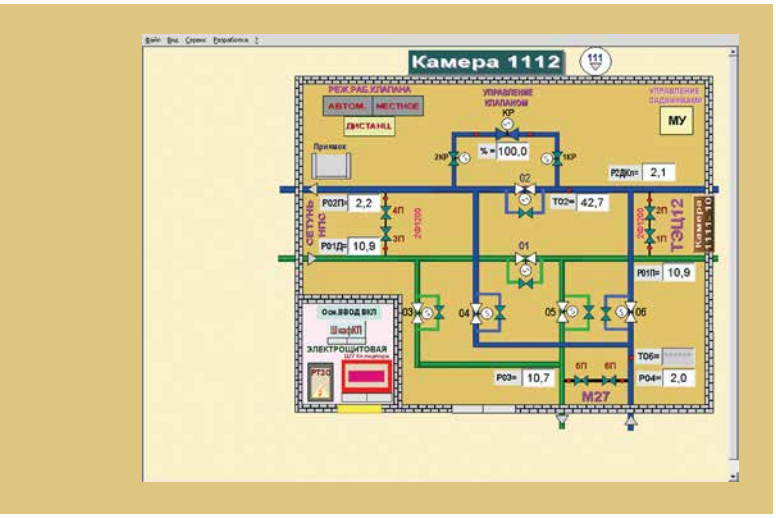
Glen Mooar

Conclusion

Using ICONICS software, the MEA was able to sync their SCADA applications in such a way that they were able to function under one system and remotely monitor facilities while still being in touch with real-time data and alarms. The success of this project is highlighted by Mike Newby, who said "We have no hesitation at all in recommending ICONICS to anyone looking for a well-designed SCADA package built upon a world-class software platform and delivered by competent and friendly engineers."

Mosenergo Heating and Pipeline
Moscow, Russia

Main Plant at Mosenergo Heating and Pipeline Moscow, Russia



Mosenergo Pipeline Monitoring/Control Screen

About Mosenergo Heating and Pipeline

The Mosenergo Heating and Pipeline Network in Moscow, Russia distributes hot water to 99 percent of all the buildings in Moscow for heating.

ICONICS Software Deployed

The entire network has 12 regional dispatch centers and over ten heating plants, pump stations and local facilities that are monitored and controlled by ICONICS GENESIS32™ and ICONICS OPC Servers. The ICONICS Modbus Ethernet OPC Server and a custom OPC Server built with the ICONICS OPC ToolWorX™ toolkit are used to gather information from this 5,000-tag distributed application. The PLCs include DEP, TM120, Motorola MOSCAD and H&B Freelance 2000.

Key Features

The main challenge for this 24/7/365 application was to deliver thousands of real-time parameters to operators and for operator commands to be delivered back down to the PLCs in a few seconds. This is where the ICONICS OPC servers come into play. Using the standard ICONICS Modbus OPC Server and a custom OPC Server built by the ICONICS OPC ToolWorX toolkit, operators are able to monitor and control the entire system from one central command center.

Tip From the Customer

The GENESIS32 system from ICONICS gives Mosenergo Heating and Pipeline total control and supervision over all the plants and pipelines from one control room.

Project Summary

Mosenergo had previously tried to develop an in-house system to monitor and control the pipeline heating network. However, the ICONICS OPC-To-The-Core™ suite of solutions made this application a reality in just a few short months of integration. The system allows total supervisory control from one central command center and keeps Moscow warm. The power of ICONICS WebHMI™ also made an impact on the selection process. Other HMI/SCADA applications were considered before a final selection was made. After a rigorous selection process Mosenergo Heating and Pipeline selected GENESIS32 from ICONICS.

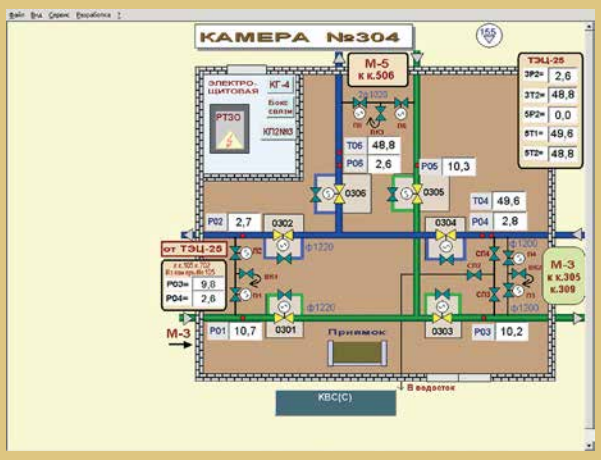
Benefits of the System

The built-in Alias feature in GENESIS32 allowed Mosenergo Heating and Pipeline to use one HMI screen or graphic file to feed over 50 different screens. The Global Search and Replace feature allowed the engineers to update hundreds of graphic files automatically. The VBA Scripting Engine in GENESIS32 also saved time, since many Mosenergo Heating and Pipeline engineers were familiar with this user-friendly scripting language.

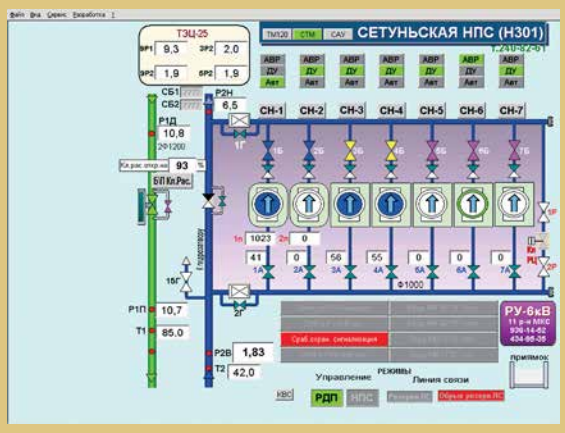
Case Study Details

Key facts about Mosenergo Heating and Pipeline:

- Distributes hot water to 99 percent of all buildings in Moscow
- 12 regional dispatch centers
- 10 heating plants, pump stations and facilities monitored and controlled by ICONICS



Overview Screen at Mosenergo Heating and Pipeline



Heating Control Screen

Conclusion

ICONICS and Mosenergo Heating and Pipeline have worked closely to make this project a success. Mosenergo was able to quickly see the savings, and is able to react to potential problems in real time. Mosenergo participates in the ICONICS SupportWorX™ maintenance program to keep its software updated and for access to ICONICS technical support personnel as needed. Future expansion includes adding more clients as well as adding more Manufacturing Intelligence applications based on ICONICS' BizViz™ suite.

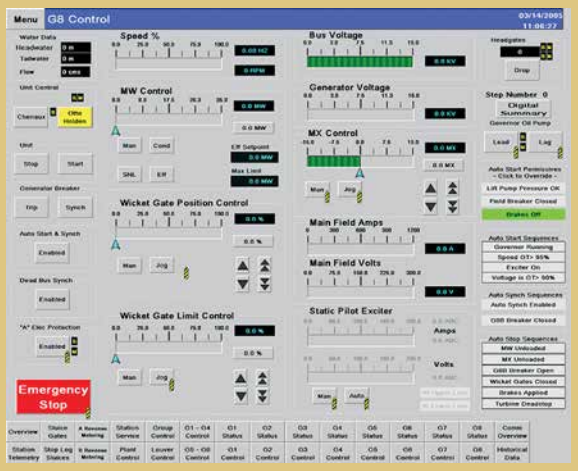
Solutions Highlighted

GENESIS32
Web-Based HMI/SCADA Visualization

OPC ToolWorX
Rapid Development OPC toolkit

Ontario Power/ Hemi Controls
Ontario, Canada

Power Generation Facilities
Ontario, Canada



Hemi Controls Control Screen

About Ontario Power/Hemi Controls

This large utility plans to upgrade its generating stations over the next few years. They selected Alstom Canada as the supplier for the modernization of this generating station. Alstom teamed with Hemi Controls Inc., a system integrator in Montreal, Quebec, to develop this large and modern control application. Hemi Controls Inc. is a systems integrator, which focuses on providing unique turnkey applications using primarily GENESIS32™ for its HMI/SCADA applications. Some of its latest projects have been in the hydroelectric generation area where Hemi's unique approaches are being used by international companies such as Alstom to provide integrated SCADA applications.

ICONICS Software Deployed

The software is comprised of GraphWorX™32, AlarmWorX™32, TrendWorX™32 MSDE, ScriptWorX™32, OPC Datamining, and Modbus OPC to communicate with the 12 Modicon PLCs in the generating station. Supervision and operations of thousands of points at the central computer is made simple with two large flat panel screens.

Project Summary

The generating station being modernized has a production capacity of 240MW. The system is comprised of one main computer supervising 8 generators including plant services equipment. There are 10 local control stations one for each unit, running on industrial type computers deployed with GENESIS32.
Sales and support of these projects have been supplied by West Isle Industries Ltd, serving ICONICS customers for the past 15 years.

Project Summary

Because of the unique requirements for this project, the new OPC driver for "data mining" in the Unified Tag Browser within GENESIS32 (which allows database write and read connections using standard SCADA graphics to a Microsoft database) is being used extensively in this application providing unique possibilities in the access to information throughout the generating station and also from remote sites. The control systems for this generating station are provided by Hemi Controls with some of its unique control software for hydroelectric generating sta-

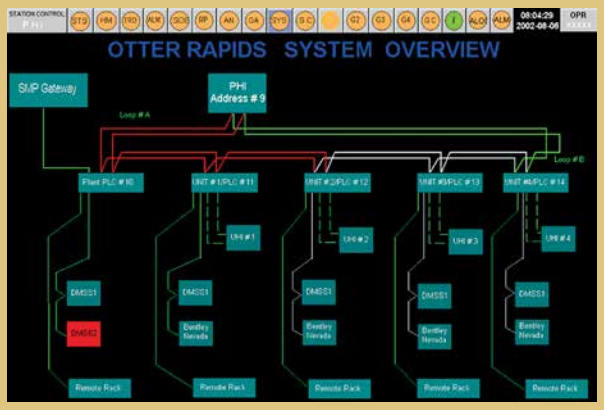
tions and generator simulation software, which are used for detailed testing and system acceptance.

Key Features

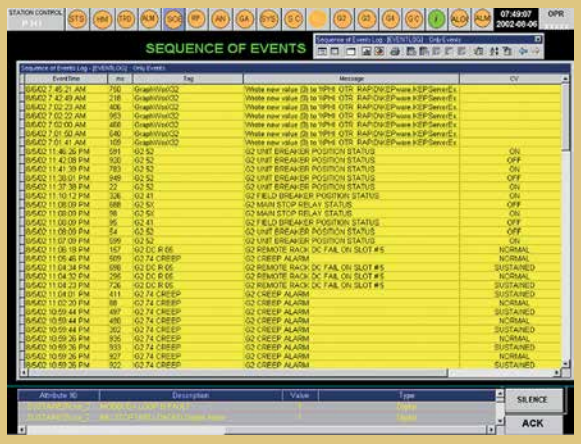
- OPC Connectivity
- Data Mining
- GENESIS32 Unified Tag Browser
- Easy to Configure Graphics
- Robust Alarming and Trending

Conclusion

GENESIS32 has also been selected for implementation of a main control center for Ontario Power Generation and will be installed in another 13 hydroelectric generating stations with a production capacity of 1,266MWs over the next few years.



System Overview Screen by Hemi Controls



Event Summary Screen

Case Study Details

The generation station being modernized has:

- A production capacity of 240 megawatts
- 8 generators
- 10 local control stations

Ontario Power is one of North America's largest power generators, and in 2008, produced 70 percent of the electricity consumed in Ontario.

Solutions Highlighted

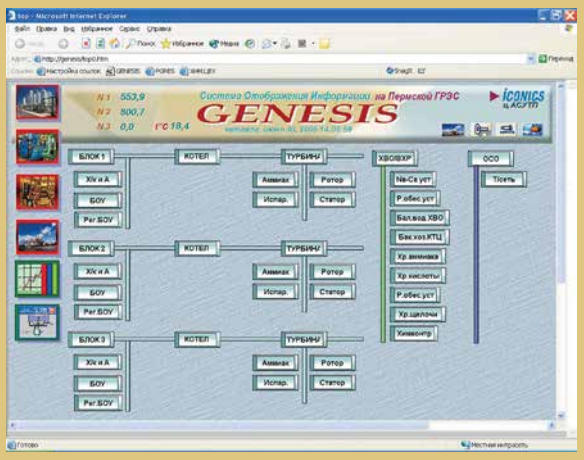
GraphWorX
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

ScriptWorX
Creation and Management of VBA Scripts for Applications

Permskaya Gres
Dobryanka, Russia

Permskaya Gres Power Plant
Dobryanka, Russia



Overview Screen at Permskaya Gres

About Permskaya Gres

The revised Permskaya Gres thermal electric power plant was built and put into operation in 1986, 1987 and 1990 with three 800-megawatt power units. The station burns gas for fuel. Since it went into operation, Permskaya Gres has produced 112,000 million kilowatts of electricity. At times, its annual output reaches 14,000 million kilowatt-hours. The station produces and delivers electricity to the federal (all-Russian) wholesale electric power market. The thermal energy it produces is delivered to consumers in the town of Dobryanka.

ICONICS Software Deployed

GENESIS32™ Enterprise, WebHMI™ and DataWorX™32 are used throughout the plant. The GENESIS32 Enterprise system is monitoring and controlling over 11,000 OPC tags. DataWorX™32 is aggregating the data from 3 different OPC servers and delivering the data in real time to the ICONICS TrendWorX™32 and AlarmWorX™32 modules of GENESIS32.

WebHMI™ form ICONICS also plays a critical role in the application. There are several remote monitoring stations in building 500-700 meters apart and WebHMI is used to allow the remote secure access. The list of WebHMI users range from senior machine operators in the power generating units to shift supervisors, department chiefs and engineers performing research in the laboratories.

Project Summary

The goals of the project are to increase the control efficiency and capacity for all power stations. Permskaya Gres calls this project “Planned Capacity Trend functionality”. The main purpose of the application is to provide information from different power generating control systems and delivering the information in real time to remote users.

Project Summary

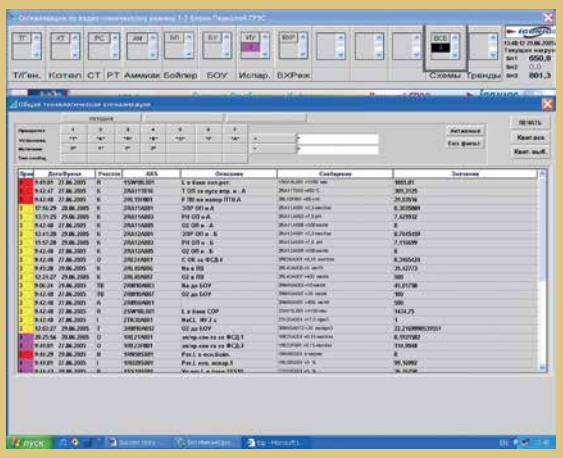
The first sub-system is monitoring signal system circuits and trends of chemically clean water treatment from all power generating units that are producing thermal electric power. The second sub-system is monitoring the planned capacity and working capacity of all power generating units. In total, there are 15 nodes running a blend of Windows Server 2000

and Windows XP and storing information data to INFORMIX and Microsoft SQL Server.
The OPC server used is called UNIOPC from Fastwell. There are several different information systems were data is coming from for this project. The systems work independently, have different hardware and software platforms and are placed far from each other. The challenge was to synchronize all this real-time OPC information. DataWorX32's from ICONICS with built in OPC Data Bridging, Aggregation and Redundancy delivered the robust functionality desired.

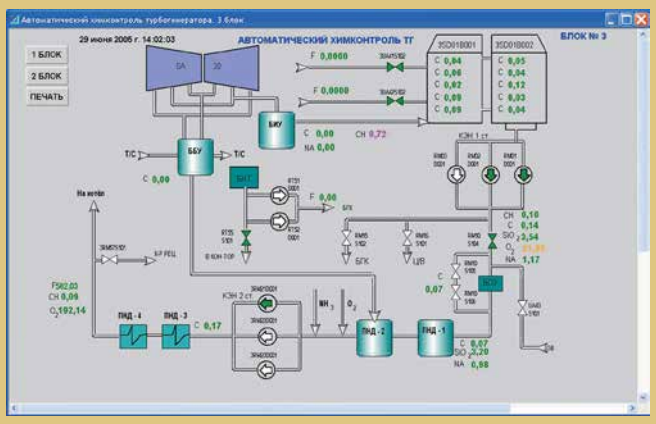
- Whole new level of visualization to real-time information
- Secure, real-time data to remote users
- Prevention of equipment failure with data analysis
- Forecast planning for capacity usage

Conclusion

Permskaya Gres has achieved their goal to increase the control efficiency and capacity for all power stations with the "Planned Capacity Trend System". Future plans include additional analysis functionality and growing the number of secure remote users.



An Alarm Summary Screen



Power Plant Control Screen

The system was developed in house in just under one year with a staff of two programmers (1 technician and 1 industrial engineer). Permskaya Gres also evaluated HMI/SCADA solutions from competitors and felt GENESIS32 from ICONICS offered more features, more flexibility, has a tighter integration with Microsoft applications, and was less expensive. Permskaya Gres estimates over a 2x cost savings for just the development by selecting ICONICS.

Benefits of the System

The system in place at the Permskaya Gres power plant provides numerous benefits such as:

- Complete aggregation from multiple control systems

Solutions Highlighted

WebHMI
Web-Based Real-Time Automation System

DataWorX
OPC Data Aggregation, Bridging, Redundancy and Tunneling

R-CUA
Strasbourg, France

R-CUA's Eco2 Wacken Biomass Heating Plant in Strasbourg, France

ICONICS GENESIS64™-Generated Visualization of R-CUA's Eco2 Wacken Facility

"R-CUA chose ICONICS first of all for the technological advances in the product, with its web interface, KPIWorX™, and the ease of sharing information between users. R-CUA also chose ICONICS products due to the good relationship with the ICONICS France team, who are open-minded and dynamic. After almost one year of use, we are still satisfied with our choice and the newly announced releases are eagerly awaited."

Frédéric Foltin
R-CUA

About R-CUA

R-CUA (www.r-cu.fr), headquartered in Strasbourg, France, specialize in the design, financing, development and operation of heat networks (biomass, geothermal energy), power stations and associated energy sources. Also known as the Urban Heat Networks of Alsace, R-CUA/R-CUE maintains 30 million euros worth of capital, with nine heating and cooling system networks over 48 kilometers in Alsace. They provide heat for the equivalent of 30,000 household units.

ICONICS Software Deployed

R-CUA, working with system integrator, CALASYS (www.calasys.fr), selected ICONICS' GENESIS64™ HMI/SCADA suite, in addition to the MobileHMI™ data mobility suite and Hyper Historian™ high-speed, reliable, robust plant historian.

Project Summary

R-CUA sought an automation software solution that would monitor the power plant and heat distribution in the city of Strasbourg in real time. The company required that the software be able to provide information via web browser as well as via mobile devices. In addition, the company sought to manage consumption and potentially save on energy costs.

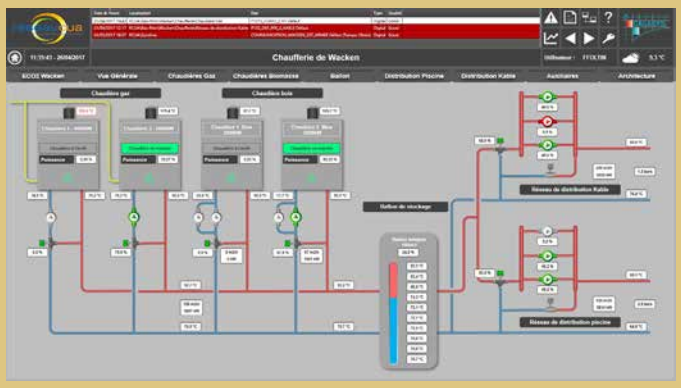
A primary location involved in the installation is the Eco2 Wacken plant, located in Strasbourg. It includes two wood boilers (at 2MW and 3.2MW) and two gas boilers (each 6MW), for total production

of over 17MW of heat. Eco2 Wacken was designed to provide heat for buildings at around 30GWh of heat supply per year, with 87 percent of production via renewable energy. R-CUA's aim with the wood boilers is to reduce CO_2 output in Strasbourg by 7,000 tons per year.

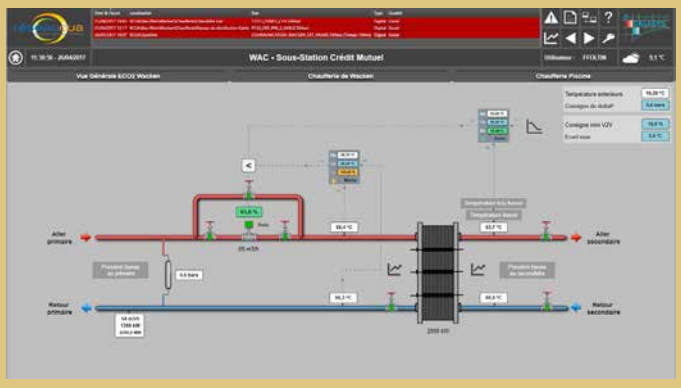
The selected automation software solution needed to integrate with multiple BACnet controllers, with three controllers located at the Eco2 Wacken plant. The entire network contains over 2,000 tags, including 16 delivery points, each managed via BACnet controller.

Benefits of the System

With ICONICS software installed, R-CUA was able to achieve its goal of widely available data access through PC-based clients as well as via mobile devices. Project design was completed within a few months with the first application deployment performed within a week. R-CUA now owns a system that can show its extensive heat network in real time. Every action can be monitored, along with any performance or optimization efforts. With an included performance trend view, operators find it easy to follow the daily operation of the entire network.



Overview Screen of the Eco2 Wacken Boiler Room Operation



A R-CUA Substation Control Screen

The delivery points and the boiler house are connected via 8 kilometers of optical fiber. R-CUA wanted a solution that would work with its existing Microsoft Windows Server 2012 R2 machines and Windows SQL 2012 databases, as well as with cloud-based servers and multiple mobile clients.

The new system would replace an existing competitor monitoring solution as well as a boiler-specific HMI, both of which were no longer sufficient for the improvements that R-CUA sought. Newer competitive options were considered before R-CUA, with assistance from CALASYS, settled on ICONICS.

Conclusion

R-CUA currently has ICONICS automation software monitoring all of its plants. The company plans to extend its heating network which will involve the connection to, and supervision of, new boilers. ICONICS will be there to ensure the heat stays on.

Power Transmission Lines
Switzerland

Swiss Grid
Laufenburg, Switzerland

swissgrid

DACF System Monitoring and Control

About Swiss Grid

Swiss Grid is an independent coordination company for the Swiss extra high voltage grid and performs services and specific tasks on behalf of the Union for the Coordination of Transmission of Electricity (UCTE, the organization that coordinates the activities of the European grid). Swiss Grid is independent from particular interests and organizations engaged in trading, supply and production. Based on its skills, tools and business information, Swiss Grid is ideally positioned to act as a trustee in the interest of the optimal organization of the Swiss and UCTE electric grids.

ICONICS Software Deployed

Swiss Grid selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite including GraphWorX™32, AlarmWorX™32, TrendWorX™32 and GenBrowser™ components. In addition, the organization utilizes ICONICS BizViz™ manufacturing intelligence and business visualization suite including BridgeWorX™ and WebHMI™.

Project Summary

Swiss Grid's main task is the security of the Swiss national transmission grid at any time, even under the intensive energy exchange between members of the interconnected European network. Swiss Grid has developed and established the concept of operational congestion forecast with the UCTE-wide Day-Ahead Congestion Forecast (DACF) module as a kernel. An industry pioneer in Europe, Swiss Grid fully automated the complex DACF algorithms and integrated them into its daily congestion management process. This automation is realized with the help of workflow-control software, BridgeWorX (with custom blocks specially developed for Swiss Grid), that is used to conditionally trigger the high-speed calculation engine, Siemens PTI PSS/E-based special development for Swiss Grid.

The calculations are based upon actual data from partners within the European interconnected network, while data presence and quality is continuously monitored with the help of an OPC-compatible File Monitor. Swiss Grid network engineers monitor and control the DACF process via the intuitive, graphical, GENESIS32-driven MMI, created in tandem with integrator, InfoTeam SA. National models

are periodically downloaded from the FTP server using dedicated BridgeWorX workflows. Files are monitored and new workflows are triggered that, in turn, execute specialized computation software. GraphWorX images help to visualize and control the current workflow states.

Key Features

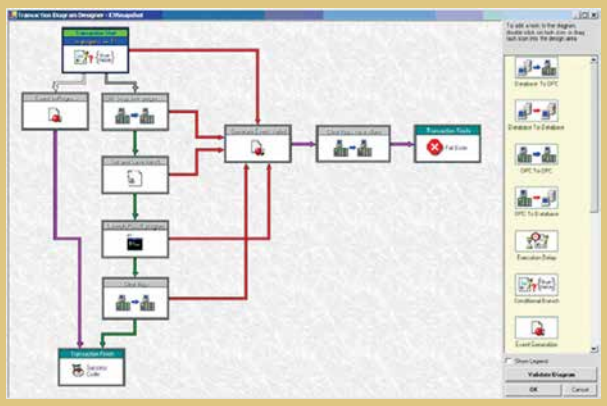
GENESIS32 was selected for Swiss Grid's DACF monitoring system due to its open nature, flexibility, and customization that allows prototype development with very low entry costs. BridgeWorX was chosen due to its ability to interface into technical processes (OPC), as the majority of other systems come from the purely business side. The software has a well defined programming interface that allows for developing complex and highly specialized custom blocks. Tight collaboration between the BizViz business visualization and GENESIS32 HMI/SCADA suites, ease of configuration, and superior graphical interfaces were also motivating factors.

Benefits of the System

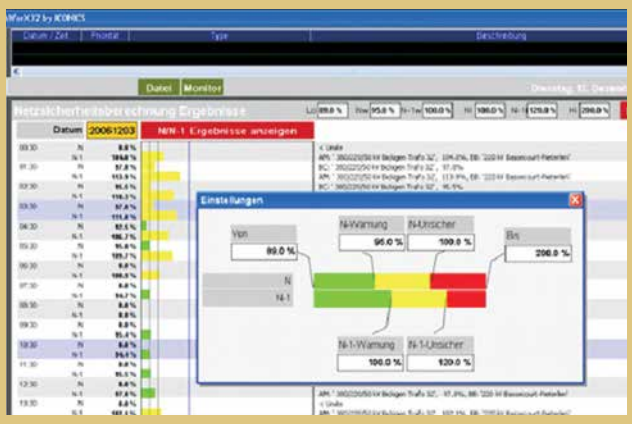
ICONICS solutions provided Swiss Grid with a quick gain in productivity and drop in manipulation errors. Swiss Grid can now set their own level of interaction (from full automation to full operator control) within processes that must run 24 hours a day, 7 days a week, 365 days a year and that must be monitored continuously. ICONICS also seamlessly integrates with Swiss Grid's network of power application systems, as well as with different national and international trading and scheduling systems.

Conclusion

Swiss Grid plans on extending their use of ICONICS software to data mining and enhanced Web utility. Through such working relationships, they are sure to remain pioneers in the European power industry.



Transaction Diagram Designer in Use



Security Forecast Screen

Solutions Highlighted

BizViz
Manufacturing Intelligence and Business Visualization Suite

BridgeWorX
Real-time Workflow Software for Data Bridging

WebHMI
Web-Based Real-Time Automation Software

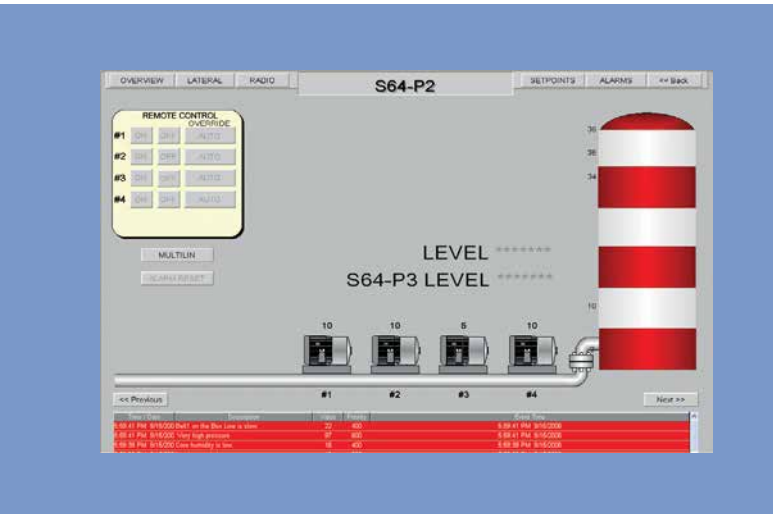
"We chose ICONICS' AnalytiX solution firstly because of the working relationship and support which ICONICS has given us in the past, and secondly because we think ICONICS now has the software tools at their disposal with GENESIS64 and AnalytiX to deliver the complete countywide SCADA, Leakage and Energy Management solution to our customer."

David Cully
Project Manager
Cully Automation

WATER & WASTEWATER

Arvin-Edison Water Storage District
Arvin, California

An Arvin-Edison Water Storage Plant in Action



An Arvin-Edison Water Level Indicator

About Arvin-Edison Water Storage District

The Arvin-Edison Water Storage District, south of Bakersfield, CA, is one of the world's most sophisticated conjunctive use programs. Arvin-Edison acquires water in wet years and stores it underground for use in dry years. This program provides water supplies to District areas covering 132,000 acres of prime agricultural land, which do not have access to surface water.

Arvin-Edison and the Metropolitan Water District of Southern California cooperate in a groundwater storage and water exchange, which benefits both agricultural users in Arvin-Edison and urban users in Los Angeles; an example of how urban and agricultural water users can work together for mutual advantage.

ICONICS Software Deployed

Arvin-Edison Water Storage District selected ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite, including: GraphWorX™32 HMI graphical display package; TrendWorX™32 Live and Historical Data Logging, Charting and Reporting software; and AlarmWorX™32 alarm management system.

Project Summary

Arvin-Edison Water Storage District uses ICONICS GENESIS32 for monitoring water levels and motors that pump water to upstream sites, as well as for remote turn on/off of pump motors in emergency situations. The district utilizes 46 pumping plants plus 10 plants that supply water level indicators only to the organization's headquarters.

The plants are controlled by local programming at the sites themselves through Westinghouse PC1100/PC1200 in older systems or SCADAPacks in newer systems. Of the 56 locations, four have recently been upgraded from older versions to more recent GENESIS32 software. The ICONICS solutions are linked to Lundahl DC1003 level indicators, Delta Controls 551 pressure transmitters, AB soft-start controllers and GE Multiline PQMII power monitors.

Benefits of the System

With their upgraded ICONICS solutions, Arvin-Edison Water Storage District is able to maintain accurate control and render visual displays of pump status and various water levels throughout the Dis-

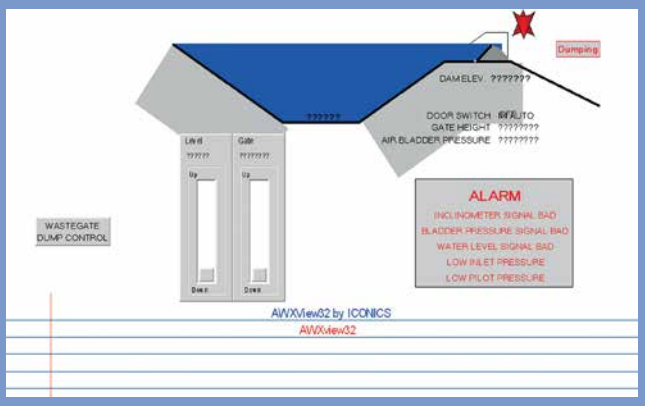
trict and control slide gates regulating water in various parts of their canal system. GENESIS32 and the individual suite components integrate easily into the District's Windows 2000 network.

ICONICS provides the near real-time information and plant control the District requires, whereas the replaced system provided updates with an 8- to 15-second delay on a continuous basis to all the connected sites.

Case Study Details

Arvin-Edison Water Storage District looked for specific benefits before deciding upon ICONICS solutions, including:

- Ease of Use in Building Graphics and Applications
- Ability to Upgrade as Needed
- Fast, Easy Implementation
- Remote Control
- Expertise with Water/Wastewater Applications



Wastegate Control Overview

Water Transfer from Ground Storage

Conclusion

Arvin-Edison Water District is pleased with the speed of implementation coupled with the nearly instantaneous data retrieval of ICONICS GENESIS32. The organization plans additional upgrades of older software to the most recent V9 release. In addition, the District plans to add the ability to remotely control Check Gates into the system.

Further on, the District plans upgrades on starters with AB Soft Start and Variable Speed drives, as well as the addition of power factor correction equipment to the motor start system, all of which will integrate into their ICONICS solution.

Solutions Highlighted

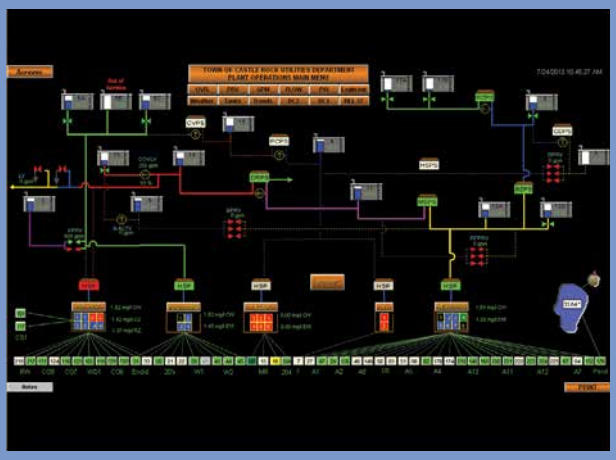
GraphWorX
HMI Graphical Display Package

AlarmWorX
Multimedia OPC Alarm Management Software

TrendWorX
Data Logging, Charting and Reporting Software

Town of Castle Rock, CO

Town of Castle Rock
Castle Rock, Colorado



Plant Operations Main Menu

> *"Without ICONICS, there is no way possible we could operate our system and provide high quality drinking water with the accuracy we demand."*

About Town of Castle Rock

Castle Rock is one of the fastest growing towns in the nation with about 50,000 residents over a mountainous, high desert in a thirty-three square mile area. Receiving its name from the towering plateau overlooking the city, Castle Rock sits on the Colorado Front Range foothills and was first founded during the gold rush of the 1860's.

Castle Rock Water is a public utility, producing high quality drinking water complete with five major water treatment plants throughout the Town of Castle Rock, generating approximately 16MGD during the high demand of the summer months. With this in mind, Castle Rock Water was on the lookout for an HMI/SCADA software management solution that would reduce engineering time and cost, as well as improve overall manageability.

ICONICS Software Deployed

With these goals defined, Castle Rock Water went on to implement ICONICS' GENESIS32™ Web-enabled, OPC-integrated HMI/SCADA suite, as well as WebHMI™ Web-based real-time automation, ReportWorX ™enterprise reporting, charting and analysis and TrendWorX™ real-time trending, historical data logging and analysis software. ReportWorX is essential as it reads archived data and provides Castle Rock Water with daily and monthly operations information, while TrendWorX is used to archive trend data to the SQL database.

Castle Rock Water's second highest cost is power. One of the major KPIs they monitor over SCADA is power consumption. Castle Rock Water installed power monitoring devices to allow them the option of monitoring power demand on their deep well pumps. This gave the engineering staff a baseline to give the operations staff the tools to make the necessary changes in pumping operations through SCADA to maximize production while minimizing cost per gallon pumped. To help accomplish these goals, the Town of Castle Rock also uses Microsoft Windows, Office and SQL Server.

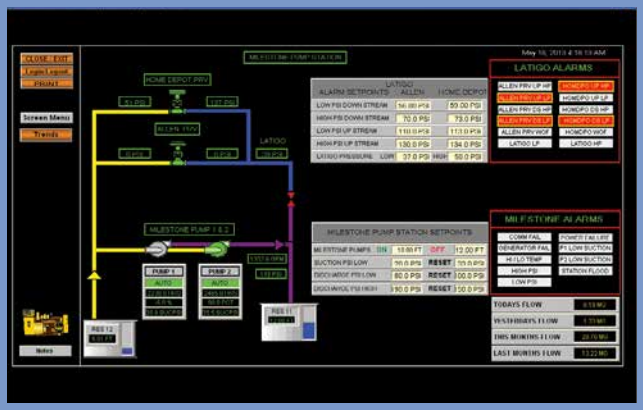
Project Summary

The whole project centers around 27 remote well sites consisting of 66 deep wells, eight pumping stations, five automated PRVs within the distribution system and 16 storage tanks capable of 36 million gallons of storage. Castle Rock Water also has seven sewage lift stations within the main system that pump wastewater to a COOP wastewater treatment facility.

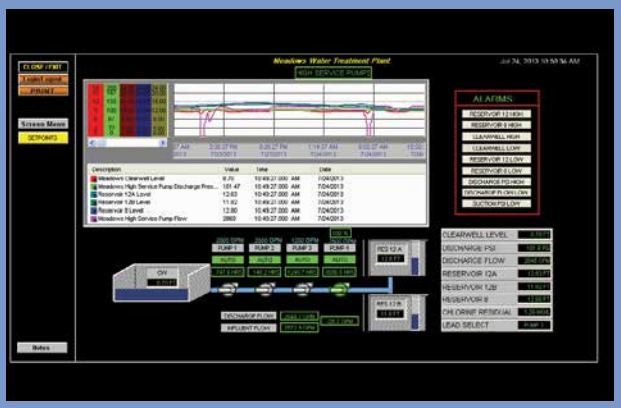
A key component of this project is that, with over 66 remote locations, Castle Rock needed a way to have all the data sync and show up in real time at a central data center. Now, reports are sent to the main data concentrator at headquarters, providing irreplaceable trending and other critical operational data.

Conclusion

Castle Rock Water chose ICONICS because of the ease of use of the application, the outstanding customer service they received from PCD and the superior support received from local companies such as RSI Company and Wunderlich-Malec Engineering. Thanks to ICONICS, the Town of Castle Rock, in conjunction with Castle Rock Water, is functioning better than ever before with a significant decrease in power usage to boot.



Milestone Pump Station Monitoring



Meadows Water Treatment Plant

Benefits of the System

After implementing ICONICS GENESIS32 suite, along with WebHMI, ReportWorX and TrendWorX, Castle Rock Water experienced a 35% decrease in power costs in the first year alone. Because the system was so easy to connect, the operators at Castle Rock Water had everything connected and working as desired within three months of beginning the project. This additional benefit allowed implementors to not only complete the project earlier than anticipated, but gave them more time to customize features to fit the Town of Castle Rock's precise needs.

Solutions Highlighted

ReportWorX
Enterprise Reporting, Charting and Analysis Software

TrendWorX
Data Logging, Charting and Reporting Software

WebHMI
Web-Based Real-Time Automation Software

Cork County Council
Cork, Ireland

Roches Point in Cork, Ireland

Bing Maps Integration with AnalytiX

"Cully Automation Ltd. chose ICONICS' AnalytiX solution firstly because of the working relationship and support which ICONICS has given us in the past, and secondly because we think ICONICS now has the software tools at their disposal with GENESIS64 and AnalytiX to deliver the complete countywide SCADA, Leakage and Energy Management solution to our customer."

David Cully
Project Manager
Cully Automation

About Cork County Council

Cork County covers an area of 2,880 square miles, making Cork the largest county in Ireland at 11% of the Irish State. After deciding to institute a directive from the European Union (EU) to reduce energy consumption by 30% by 2020, Cork County Council realized that understanding their area's network would be crucial in providing superior service. Cork County Council treats and supplies water to approximately 40,000 non-domestic customers and 100,000 homes across the county. Due to its size, Cork County is broken up into four zones–North, South, East and West Cork–which makes data aggregation even more difficult to manage. At the time, the council was using manual data entry with Excel to produce the leakage figures required by the Department of the Environment. However, with four zones to maintain, this method made it too difficult to efficiently calculate leakage figures.

ICONICS Software Deployed

This is where ICONICS' GENESIS64™ and AnalytiX® products really come into their own; Cully Automation Ltd. was able to simply convert the existing graphics that had been deployed on earlier GENESIS32™ projects, and connect directly to the SCADA data.
However, it was not just ICONICS' SCADA that needed integration, with the County having a number of legacy non-ICONICS SCADA solutions still operational, there were many components needing additional conversion. By using GENESIS64 and the OPC platform, the full integration was a seamless process, providing what is now a true Countywide visualization solution leveraging Bing™ maps.

From this single SharePoint® 2010 view, the Council can access charts and reports on the status of any meter from any DMA in the county.

Project Summary

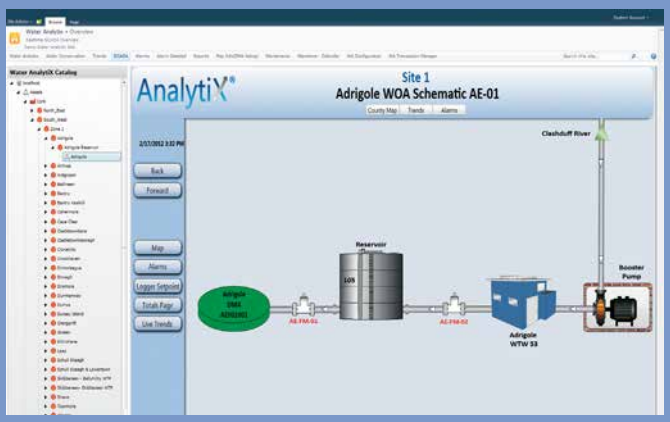
The average daily volume of water produced in Cork County is estimated to be well over 150,000 yd^3/day with the total length of water in the Public Water Supply Schemes estimated to be 3,500 miles long. The number of yards from which to retrieve that data continues to increase – approximately 391 District Metering Areas (DMA) with up to 3 yards per DMA.

With such a vast supply network, the Council could not meet the new EU directives on energy consumption by continuing to use traditional manual data collection methods. Therefore, with the EU regulations looming, and the scale of data collection increasing, Cork County looked to Cully Automation Ltd. to install a number of Plant SCADA systems to control and monitor local stations.

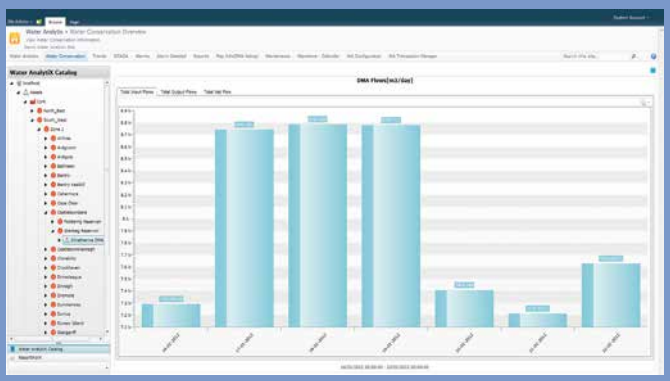
Due to the nature of this deployment, a collaborative approach was undertaken by ICONICS application support engineers and Cully Automation Ltd. This allowed Cully Automation Ltd. to impart their knowledge and expertise in Water Conservation projects which led to AnalytiX product enhancements, strengthening the product for everyone. This is a business model ICONICS is proud to use and enables the company to remain at the cutting edge of industry standards.

Benefits of the System

ICONICS products enabled the system to daily send data from each remote meter, to be read in the Historian and used for calculating the water usage for each DMA. By using a simple, intuitive point-and-click interface, an asset tree of DMA's was able to be quickly created and calculations added. By leveraging the latest Microsoft® SQL Server® 2008 R2 technologies, including StreamInsight, the collected data was then integrated together to produce an up-to-date and accurate DMA water usage figure.



AnalytiX Overview Screen of a DMA



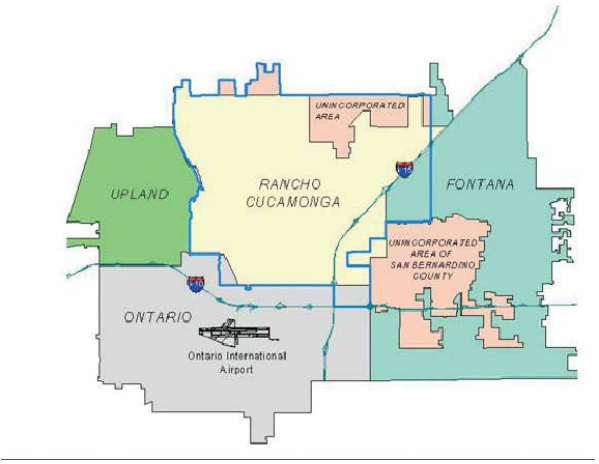
A Bar Chart Comparison of Daily Water Use

Conclusion

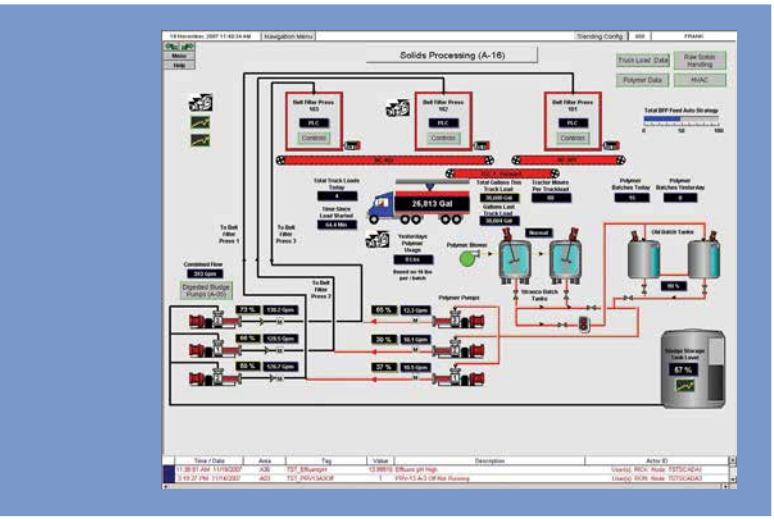
David Cully, Project Manager, said "We were the only company to be able to provide a turnkey solution from putting the meter in the ground, to delivering a leakage report on the county manager's desk. This was achieved because ICONICS' GENESIS64 and AnalytiX products provide a consistent user interface designed upon open industry and IT standards."

The Cork County Council Water Conservation project ended up with over 1,000 remote telemetry flow meters sent data via GPRS and over 1,000 data points all integrated into a single view of County-wide SCADA, Water Conservation & Energy Management.

Cucamonga Valley Water District
Rancho Cucamonga, California



District Map of Cucamonga Valley Water District



LWM Filter Screen

> *"With products such as GENESIS32, PocketGENESIS, and WebHMI, ICONICS has helped us accomplish our control system goals."*
>
> **Ed Diggs**
> Production Supervisor
> Cucamonga Valley Water District

About Cucamonga Valley Water District

Cucamonga Valley Water District (CVWD), headquartered in Rancho Cucamonga, California, has as its mission "to provide high quality, safe and reliable water and wastewater services, while practicing good stewardship of natural and financial resources". Its service area includes Rancho Cucamonga, and portions of Upland, Ontario and Fontana, and some areas of San Bernardino County. CVWD serves a population of approximately 170,000 customers within a 47 square mile area.

CVWD, a public corporation, functions as a Special District, which means it is an independent unit of local government serving the needs of a community. With approximately 45,000 water connections and 35,000 sewer connections, CVWD is one of the leading water suppliers in the region thanks to its innovative water treatment technologies and its leadership in addressing regional and state water issues.

ICONICS Software Deployed

Among Cucamonga Valley Water District's ICONICS solutions are GENESIS32™ Enterprise HMI/SCADA suite integrated with AlarmWorX™32 MMX distributed enterprise-wide alarm notification system, ReportWorX™ enterprise reporting, charting and analysis software, WebHMI™ Web-based real-time automation software, Pocket GenBroker communications bridge, OPC Data ToolWorX™, ICONICS AB OPC Server, and SQL/MSDE Logging.

Project Summary

Cucamonga Valley Water District began an expansion project intended to simultaneously bring Web-based and mobile functionality to their control system. The organization needed such features in an HMI/SCADA solution that would integrate with existing systems (AB Controls, Rockwell, etc.) and operating systems (moving from Microsoft Windows 2000 to XP).

Working with engineering partner, Black & Veatch, CVWD sought a Web-enabled solution that wasn't processor-intensive, a mobile component for employees in remote locations, and comprehensive reporting abilities. ICONICS GENESIS32, coupled with WebHMI and ICONICS' Pocket GENESIS mobile Pocket PC industrial software, fulfilled expectations.

Benefits of the System

ICONICS was able to meet Cucamonga Valley Water District's Web, mobile, and reporting needs for their industrial automation. WebHMI provides a browser-based alternative to single PC-based software. Pocket GENESIS allows CVWD to monitor and control their system away from the plant environment. The plant is able to utilize ReportWorX to fulfill their reporting requirements to the California Department of Health. In fact, ICONICS met CVWD's requirements through multiple phases including monitoring, reporting, and alarming.

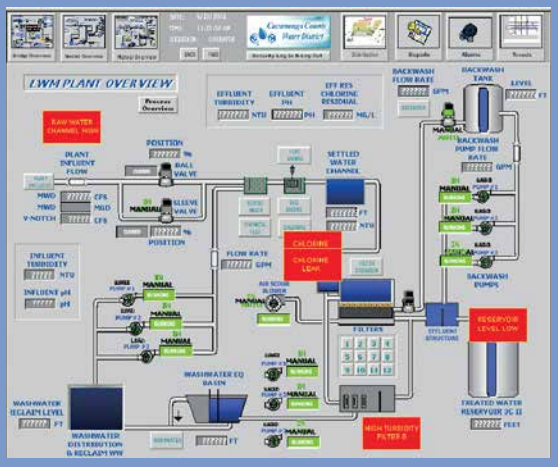
Conclusion

Cucamonga Valley Water District and its project partner selected ICONICS not only due to its wide array of HMI/SCADA solutions and multiple features (Web, mobile), but also due to the reputation for the software's ease of use.

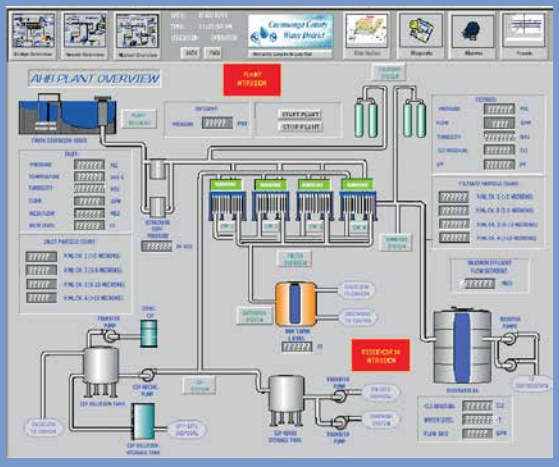
Case Study Details

Cucamonga Valley Water District required the following in their selection of their HMI/SCADA solution:

- Mobility – access via "pocket" device
- Web-enabled solution
- Wide alarm notification options
- Comprehensive reporting mechanism



LWM Plant Overview



AHB Plant Overview

Solutions Highlighted

Pocket GENESIS
Mobile PC Industrial Software

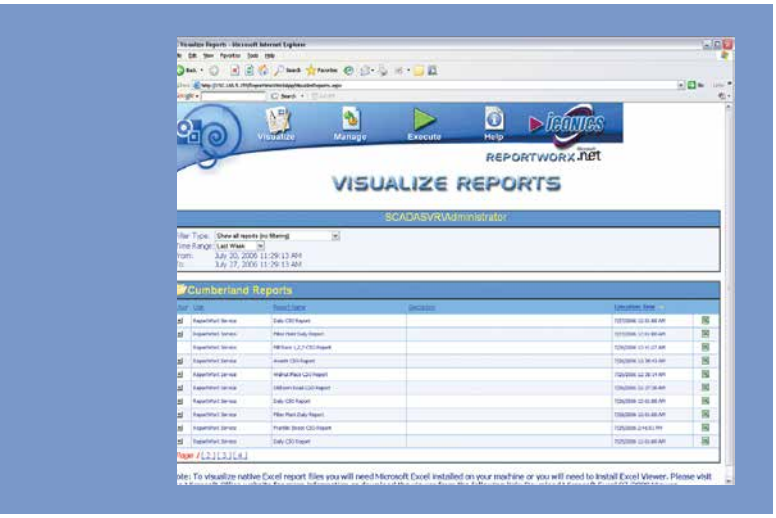
AlarmWorX
Multimedia OPC Alarm Management Software

ReportWorX
Enterprise Reporting, Charting and Analysis Software

City of Cumberland, MD

City of Cumberland Water/Wastewater

Cumberland, Maryland



Daily CSO Report in ReportWorX

About City of Cumberland Water/Wastewater

The City of Cumberland, Maryland (population 25,000) is a beautiful little city nestled among the Appalachian Mountains. Established in 1787, it's the home of the first national road, now known as Route 40 or National Highway. Over the years, it has also been home to numerous railroads and was the western terminus of the famous C&O Canal. Cumberland sits approximately 950 feet above sea level and has an annual rainfall of 36.5 inches and an annual snowfall of 34.1 inches.

ICONICS Software Deployed

GENESIS32™ Enterprise Editions are deployed on dedicated workstations at the Water Filtration Plant and the Wastewater Treatment Plant. They utilize GraphWorX™32 for process visualization and operator runtime information. Both AlarmWorX™32 and TrendWorX™32 are deployed and remotely log data to a main server-class computer running Microsoft SQL Server located downtown.

The server uses ReportWorX™, part of the ICONICS BizViz™ suite, to automatically generate reports for both the Water Filtration Plant and the Wastewater Treatment Plant. AlarmWorX™32 Multimedia runs on the server to provide remote alarm annunciation to plant personnel. ICONICS WebHMI™ also runs on the server allowing plant supervisors remote access to the system, anywhere in the city.

Project Summary

With an existing installation at the Wastewater Treatment Plant, ICONICS was the logical choice for the new system. It was designed to visualize information of remote pumping stations, elevated tanks and reservoir levels for the Water Filtration Plant and for visualizing and reporting information about Combined Sewer Overflow (CSO) events, important to the Wastewater Treatment Plant and the surrounding watershed authorities. When it rains, or when snow melts, there exists potentials for CSO events. Once manual and highly labor intensive, these events are now tracked in real time and reported on as soon as the event has ended.

The system was installed and commissioned by Consolidated Electric, Inc. of Cumberland MD with the help of ARK Systems, Inc. of Columbia, MD and O&M Engineering of Ellicott City, MD,

under the supervision of KLH Engineers, Inc. of Pittsburgh, PA.

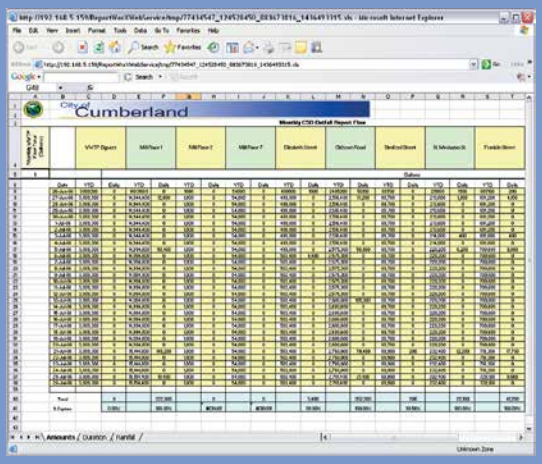
KEPWare Modbus/TCP OPC Servers installed on both ICONICS GENESIS32 workstations facilitate communications to Schneider Electric M1E PLCs. This is done via wireless broadband Ethernet over the Allegany County ALLCONET. The ALLCONET infrastructure is an IP-based, high speed Intranet providing the security of a world class firewall and the stability and speed of a fully monitored microwave network.

For the CSO events, the PLCs are connected to sensors that determine sewer overflow and begin accumulating that data inside the PLCs that is then logged to the remote server and reported on by ReportWorX. For the Water Filtration Plant purposes, the PLCs are connected to sensors that determine tank levels and pump station water flow usage and accumulate that data inside the PLCs that is then logged to the remote server and reported on by ReportWorX.

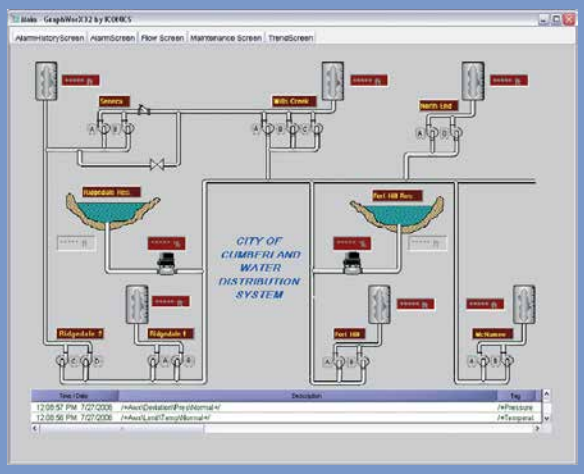
On a daily basis, ReportWorX generates a Filter Plant Daily Report. The Filter Plant Daily Report is a combination of sub reports and chart data plots done via separate Excel worksheet tabs. The sub reports are for daily, weekly and month to date totals of motor/pump runtime hours and station flows, in addition to daily tank and reservoir levels listed every one-half (1/2) hour. The chart data plots are for the daily tank levels. Each site where the tank level is measured and logged has a separate chart plot, on its own sheet, in the report.

Key Features

By deploying ICONICS GENESIS32, the City of Cumberland has seen numerous productivity enhancements. At the Water Filtration Plant, with pump station intrusion alarms and pump failure alarms, plant operators can respond to critical problems as they arise, saving valuable time and money.



Monthly CSO Outfall Report Flow



Water Distribution System Screen

Having real-time information allows the Wastewater Treatment Plant personnel to provide surrounding watershed authorities with the information they need to respond accordingly to overflow situations. Additionally, information that has been gathered could possibly save the city on future capital expenditures by allowing them to build structures based on actual and not estimated capacities.

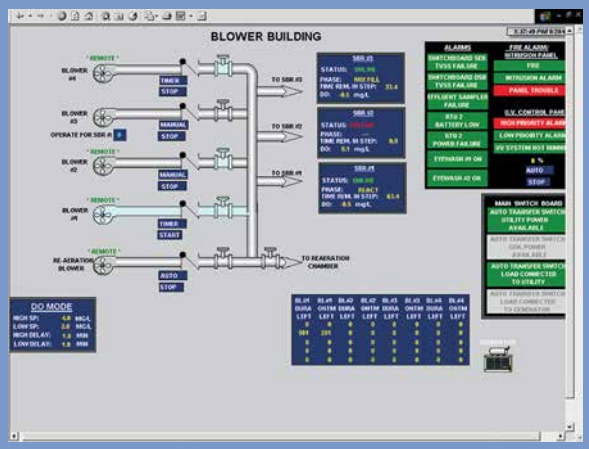
Conclusion

Utilizing a combination of ICONICS BizViz Suite and GENESIS32 Enterprise Suite, the City of Cumberland has a system that will pay for itself by enhancing productivity and reducing overall operating costs.

East Coast Water & Wastewater Company
Eastern United States

ECWW

Water Treatment Plant in Operation



Blower Building Monitoring/Controls

About East Coast Water and Wastewater Company

East Coast Water and Wastewater Company (ECWW) is a large water production and sewage treatment operation on the East Coast of the United States. ECWW is one of many water and wastewater companies managing water production and waste removal facilities across the United States and Canada which are using ICONICS products to manage their operations.

ICONICS Software Deployed

Over 70 ICONICS GENESIS32 SCADA Workstations in 32 different plants performing supervisory functions, using GraphWorX32, AlarmWorX32, TrendWorX32, ScriptWorX32, Multimedia Alarm Annunciation, and WebHMI products.

Key Features

ECWW utilized OPC-enabled, local and WebHMI-based water and wastewater processing using Web browser/Thin Client/Internet technology to provide production, maintenance and management personnel with real-time visualization and important alarm information. Every aspect of potable water production and sewage processing is controlled and supervised using the ICONICS GENESIS32 SCADA capabilities with real-time Web access via ICONICS GenBroker technology and Bristol Babcock RTU I/O hardware products. These systems provide a cost-effective means of providing alarms, data, and trends to operations and management on demand.

Project Summary

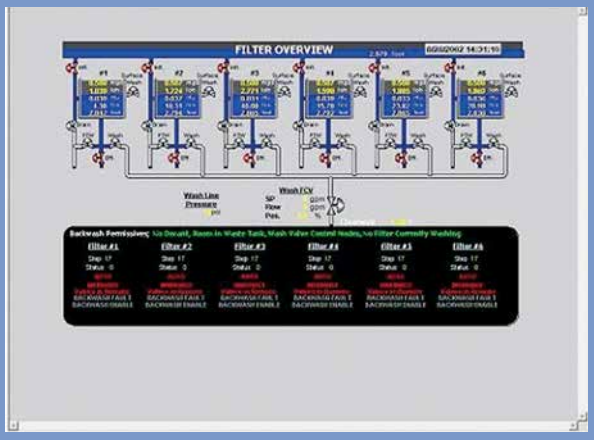
Over 200 Management and Operations personnel at ECWW Company utilize the ICONICS WebHMI and GENESIS32 software to monitor and control 32 plants scattered over the entire state. These systems provide access to information for over 12,000 I/O points via 650 GENESIS32 screens. Six thousand of those points are available via 350 WebHMI pages with OPC data. These view-only screens are available to properly logged-in users on the ECWW Company Wide Area Network.

In addition to viewing real time alarms and system faults, Microsoft Access is used to record all alarms, events and operator actions for long term alarm archiving and alarm reporting. Local operator stations print the alarms as they occur and store

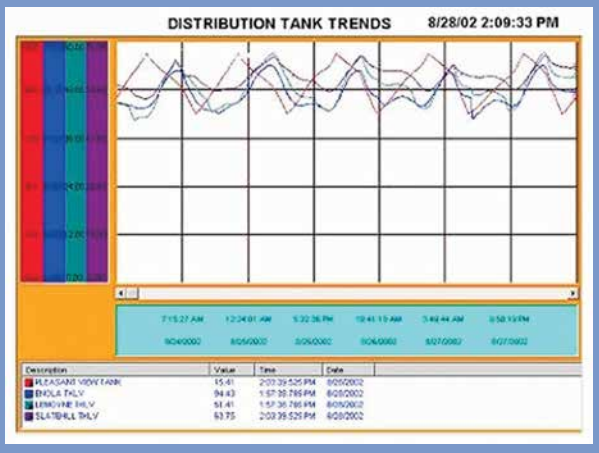
them to local Alarm Logs with AlarmWorX32 Logging. Several local operator stations are equipped with the ICONICS Multimedia Alarm Notification option software so that supervisors and operators may be notified via alpha-numeric pagers and telephones when critical systems require immediate attention. Local Operators, Supervisors, and corporate office management staff view trend data from the entire system via an ICONICS WebHMI Server using GenBroker routing over their Wide Area Network. Users can view daily, weekly, and longer trends as needed to manage the flow of water through the plants and into the distribution network.

East coast-based ECWW Company uses WebHMI to provide view-only access for management and supervisory personnel. WebHMI, running on Windows 2000 and Internet Information Server from Microsoft, provides real-time OPC Data for the view-only screens. Six thousand I/O points are available via 350 Web pages. These screens are available to properly logged-in users on the ECWW Company Wide Area Network. Trends and overview pages are available, for almost instantaneous access, to qualified personnel.

The communications network backbone of the project depends on TCP/IP and provides good performance for Web-based access to critical process information. A dedicated Windows 2000 PC is used to maintain the centralized License and Security backbone. All WebHMI users request security permission and login authentication from the centralized Windows 2000 level security system. A system of secure routers and firewalls is used to provide physical security for the TCP/IP WAN.



Filter Controls Screen at This East Coast Water & Wastewater Company

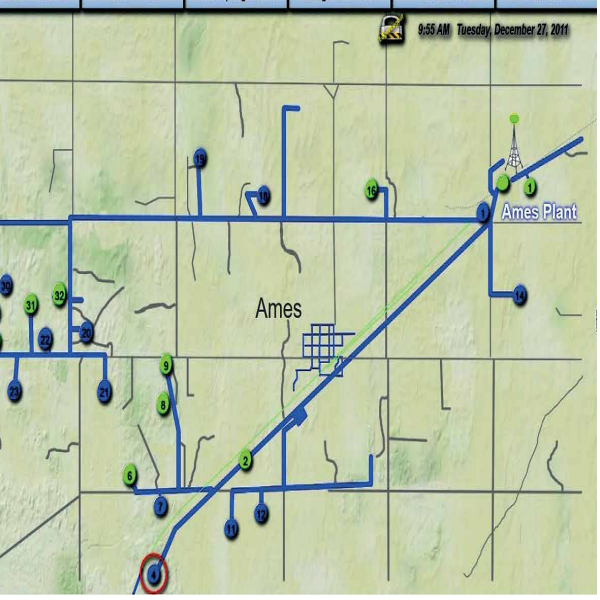


Distribution Tank Trends

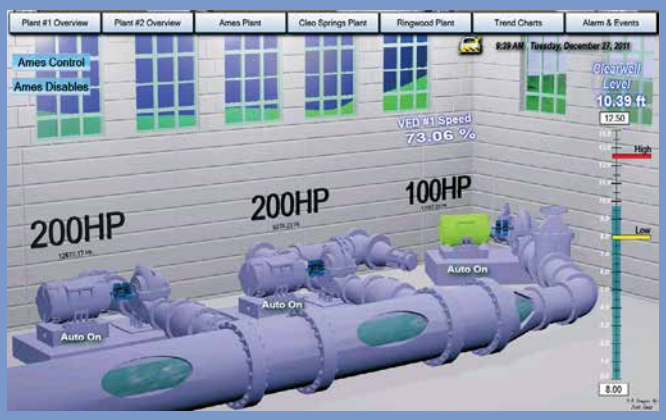
Conclusion

ICONICS has worked closely and successfully with ECWW Company and Bristol Babcock, an ICONICS OEM, to make this statewide water project a great success. ECWW Company participates in the ICONICS End-User Support and Maintenance program to keep their software updated.

City of Enid
Enid, Oklahoma



Interactive Map Showing the City of Enid's Ames Plant



A City of Enid Water Production Control Screen Developed using ICONICS GENESIS64

> *"(GENESIS64 is) friendly point and click set-up software with no additional help needed."*
>
> **Roy Robins**, Systems Integrator
> City of Enid

About City of Enid Water/Wastewater

The City of Enid, Oklahoma is located 70 miles North of Oklahoma City. The city's water management services include production, distribution and reclamation. The Water Production department is responsible for "the maintenance and operation of the water collection system, and treatment plants. The water is treated, tested, metered and monitored to meet the most stringent requirements set down by the State Department of Environmental Quality, the Federal Department of Environmental Quality and the Federal Environmental Protection Agency."

The collection system serves about 50,000 residents, with an average of 11 million gallons daily and peaks of 20 million in the summer. It includes approximately 140 producing underground water wells with 200 miles of collection lines, 23 million gallons of storage tanks, seven pumping stations and two treatment plants. The department operates seven days a week to produce safe, potable water for residential, commercial and industrial customers.

ICONICS Software Deployed

The City of Enid selected ICONICS GENESIS64™ 64-bit HMI/SCADA software, including GraphWorX™64 vector-based 2D/3D graphic design and WebHMI™ Web-based, real-time automation. In addition, they also selected ICONICS OPC Server Suite (supporting both OPC-UA and OPC-DA connectivity).

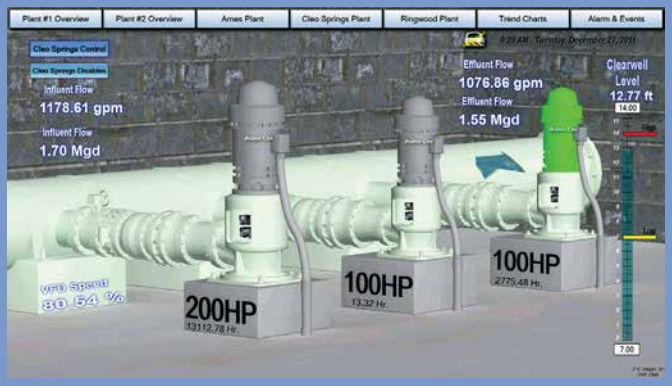
Project Summary

The City of Enid's Water Production department sought to upgrade its control system. Originally consisting of push-button controls, it evolved from an older simple one-line diagram type to ActiveX-based controls. The city considered multiple solutions, including those from several competitors, then decided

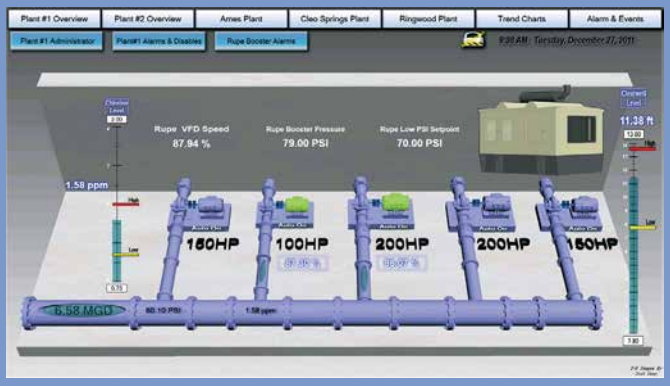
upon ICONICS GENESIS32™ HMI/SCADA suite and have recently upgraded to GENESIS64.

Following a 60-day development cycle, the department initially used their new ICONICS software to design and implement their new Water Production control system. The goal was to standardize on the selected software and provide an interface with ease of access for all operators. Using GENESIS64 resulted in an exact 3D view of remote stations and pump rooms. The department is also developing a new Wastewater system with their

Next, they wanted HMI/SCADA software that they considered secure enough for a municipal project. They also wanted HMI/SCADA software that would allow for ease of programming for their operators, which they found within the Workbench, the centralized Web-based interface that makes it easy for users to open GENESIS64 products and configure components, runtime, and security. Finally, the department wanted a solution that easily integrated with OPC technology and standards, which is handily provided through ICONICS OPC



A GENESIS64-built Monitoring/Control Screen for the City of Enid's Cleo Springs Location



An Additional City of Enid Water Plant Control Screen

systems integration partner, Integrated Controls, which will also feature GENESIS64.

The department's new system handles over 1,400 tags in its Water Production system, which now integrates with their Koyo PLCs. The ICONICS software also ties into additional hardware including wireless, serial and networking connections (e.g. UHF, VHF and FSK [Frequency Shift Key]). Among the Microsoft products in use are Windows Server 2008, Security Essentials and SQL Server.

Benefits of the System

The City of Enid's Water Production department saw several benefits in implementing ICONICS software. First, they wanted a solution that would integrate seamlessly with Microsoft SQL Server. Server suite. An additional benefit comes from ICONICS WebHMI. The water control system is now accessible via a standard Web browser.

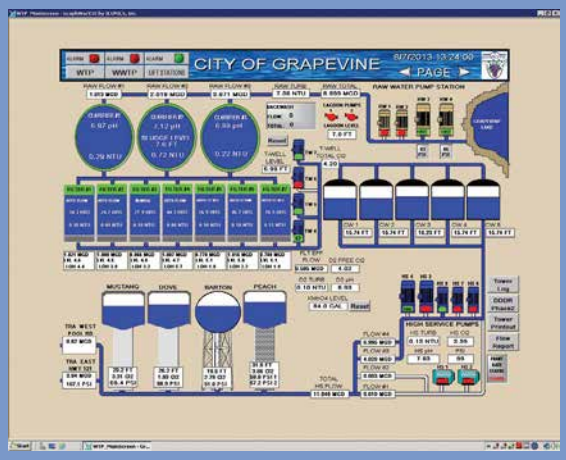
The systems integrators for the city have ultimately found ICONICS software to be truly "user-friendly" and they appreciate being able to easily design their project in-house. Future plans for the department are to expand the Water Production system, as well as integrate more Web and mobile access.

Conclusion

In the end, the City of Enid's Water Production department sought a new system that would "give the operators a smooth, graphical interface and fast, reliable and accurate data". Their upgrade to the latest 64-bit solutions from ICONICS was a fluid transition.

City of Grapevine
Grapevine, Texas

City Hall in Grapevine, Texas



Water Treatment Plant

> *"We have been extremely pleased with the functionality and operation of the ICONICS software. We have utilized many of their features, and they have allowed us to implement a full scale replacement of our system."*
>
> **Kent Conkle**
> Utility Manager
> City of Grapevine

About City of Grapevine

The Historic City of Grapevine is located in the Dallas-Fort Worth area in North Texas and boasts both exciting city life and beautiful countryside. The City of Grapevine has a population of approximately 50,000 people and is one of the oldest settlements in the Lone Star State.

City staff realized the need to replace their existing HMI/SCADA, PLCs and radio communications systems or do a serious upgrade. The City of Grapevine's needs, as a city, were growing and they needed a system better able to handle a diverse and multifaceted infrastructure. Additionally, they were also faced with the potential of the FCC narrow banding their frequency, which would affect the reliability and functionality of their existing PLCs, communications and stability of their current system as a whole. This set of needs started the journey to find the best option for Grapevine.

ICONICS Software Deployed

After an initial evaluation process, the City of Grapevine decided that ICONICS GENESIS32™, AlarmWorX32™ Multimedia, ReportWorX™, WebHMI™ and an OPC UA Server were the best ways to go for this project. The city, along with the assistance of ICONICS' representative PCD Sales, selected the ICONICS software package based on high ratings on functionality, price, renewal options, local vendor knowledge and customer support.

Project Summary

The City of Grapevine began their investigation by reviewing the cost associated with upgrading the support of their existing HMI/SCADA and leaving their original system intact. This would have had the least amount of work. However, it also would have

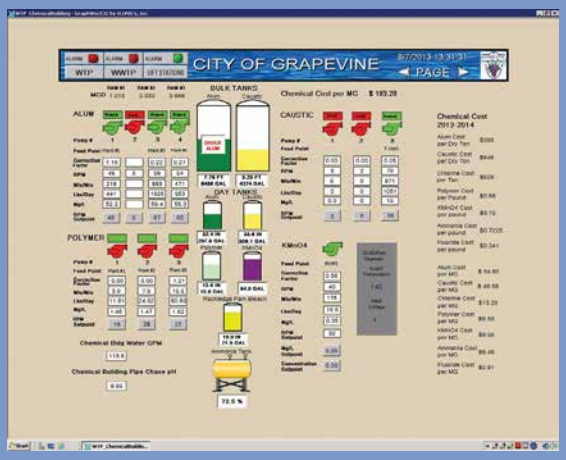
severely reduced their monitoring capability. With both the current HMI/SCADA support renewal and FCC items looming, they decided to make the effort to do a full system replacement. This replacement required an upgrade of everything in the system from PLCs, radios and the HMI, to dozens of hours of electrical work.

Once ICONICS HMI software and the PLCs were selected, the City Staff figured out how to proceed with a challenging large-scale project while staying within budget. The total project would include a potable water treatment plant, a booster pump station, a wastewater treatment plant, a raw water pump station, one lake aeration station, four elevated storage tanks, two water entry vaults and 31 sewer lift stations on two servers and 15 Web clients. With their necessity of implementing this project in-house, the City Staff knew that this would require multiple disciplines and an extensive amount of knowledge, so they recruited the city's Information Technology Division, Traffic Division and the Utility Division to form an installation team that would perform all the field work. Once these Divisions were all working together, the City of Grapevine realized they had a substantial amount of talent on board internally and were able to pull this project off successfully with ICONICS and PCD Sales. City Staff then developed a process for monitoring their assets utilizing ICONICS HMI/SCADA software for their water treatment plant and its lift stations. City staff evaluated the screen designs from the existing system and repurposed those as templates for the new ICONICS screens. After this, they started expanding the ICONICS program to include chemical feed screens and others not part of the original system.

Benefits of the System

Benefits of the ICONICS system for the City of Grapevine are vast. To start, the new system provides enhanced monitoring, control, alarms, reports and notifications. Information is more reliable with ICONICS and is acquired on a timely basis. Allowing the enhancement of existing stations while achieving cost savings and varied options remains an incredible improvement over the previous system.

Lift Stations



Chemical Building Screen

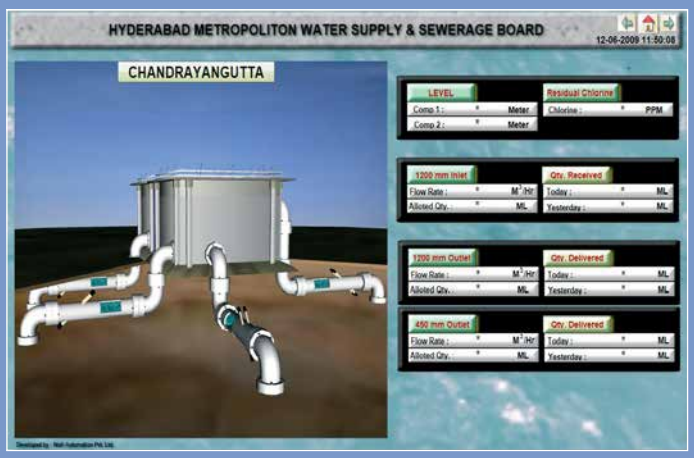
Conclusion

Installation of the ICONICS HMI/SCADA systems was about 80 percent complete at the Water Treatment Plant when its existing competitor brand HMI/SCADA system failed. City Staff was pleased that they had decided to change systems and upon full implementation of ICONICS they are very satisfied with the selection of the ICONICS HMI/SCADA software.

In the end, the project contained 2,271 tags and was up and running successfully in less than 15 months. The City of Grapevine is currently in the process of expanding their ICONICS system to their wastewater treatment plant and more.

Hyderabad Metropolitan Water Supply & Sewerage Board
Hyderabad, India

A Water Processing Facility at Hyderabad Water Supply & Sewerage Board



Overview of the Chandrayangutta Tank

About Hyderabad Metropolitan Water Supply & Sewerage Board

Hyderabad, the capital city of the state of Andhra Pradesh is one of the fast growing urban conglomerations in India. It is a typical inland city located in the south-eastern part of the deccan plateau with a semi-arid climate and a rainfall of 75 cms.

The Hyderabad Metropolitan Water Supply & Sewerage Board (HMWSSB) was constituted on 1/11/1989 under the provisions of the Hyderabad Metropolitan Water Supply and Sewerage Act 1989 (Act No . 15 of 1989), with the following functions and responsibilities in the Hyderabad Metropolitan Area:

- Supply of potable water including planning, design, construction, maintenance, operation and management of water supply system

ICONICS Software Deployed

The Hyderabad Metropolitan Water Supply & Sewerage Board, working with Nish Automation Pvt Ltd of Surat, selected ICONICS GENESIS64™ 64-bit-enhanced, Web-enabled, OPC-integrated HMI/SCADA suite, including its GraphWorX™64 graphics development/runtime environment and TrendWorX™64 data collection/logging/charting/reporting/analysis components. The agency also installed ICONICS WebHMI™ Web-based real-time automation software as well as ReportWorX™ enterprise reporting, charting and analysis software, which is a component of the BizViz™ business visualization suite.

Project Summary

Water comes at a premium during the hot dry months in Hyderabad, the most populous city in Andhra Pradesh. A respite from the heat and relative water scarcity comes during monsoon season, which typically lasts from late June to early October. The HMWSSB has been tasked with ensuring a reliable source of water and waste treatment for its citizens. The board is also involved in other water-related projects including rainwater harvesting and water bottling/canning.

The board sought assistance in automating its water supply/sewer facilities and contacted Nish Automation who, in turn, recommended ICONICS' industrial automation software solutions, specifically the company's GENESIS64 suite that integrates with new 64-bit computing machinery and the latest operating systems from Microsoft (including Windows Vista® and Windows Server® 2008).

The HMWSSB required a way to collect, measure, visualize and control the data from its multiple facilities located across a wide area, keeping track of the city's water from its sources to its outlets. Industrial PCs running GENESIS64, WebHMI (5 nodes), ReportWorX Lite and other ICONICS software connect to 84 Remote Terminal Units (RTUs) (with Schneider Electric PLCs for I/O), which are, in turn, connected by seven Matrix Simado GDT11 fixed cellular terminals (FTCs) and a Moxa Nport 5610 Serial Driver. These RTU/PLC systems are hard-wired locally to Siemens flow meters, level transmitters, etc. for the purpose of water auditing via SCADA.

Key Features

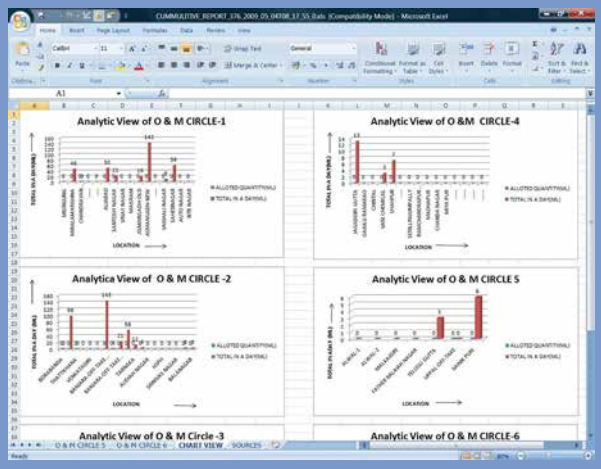
The Hyderabad Metropolitan Water Supply & Sewerage Board had multiple configuration requirements for a new HMI/SCADA solution, all met by ICONICS software's capabilities, including:

- Real-time OPC Tags
- Ability to Have Local and Remote Connectivity
- Historical Data Access
- 2D and 3D Graphics and Trend Charts
- Flexible Reporting for Scheduled and Ad Hoc Reporting
- Ability to Interface with SQL Server

The HMWSSB benefits from 64-bit-optimized technologies (GraphWorX64 graphic development, TrendWorX64 logging, etc.) from the GENESIS64 suite, combined with ICONICS' Data Mining Configurator, Unified Data Manager, ReportWorX and more.

Conclusion

ICONICS, working with Nish Automation, was able to meet the HMI/SCADA and business visualization needs of the Hyderabad Metropolitan Water Supply & Sewerage Board, assisting the agency in its goal of providing a reliable water supply for the city's residents.



A Hyderabad Metropolitan Water Supply & Sewerage Board Report in Chart View

A Geographic Overview of a Division Within the Board's Service Territory

Solutions Highlighted

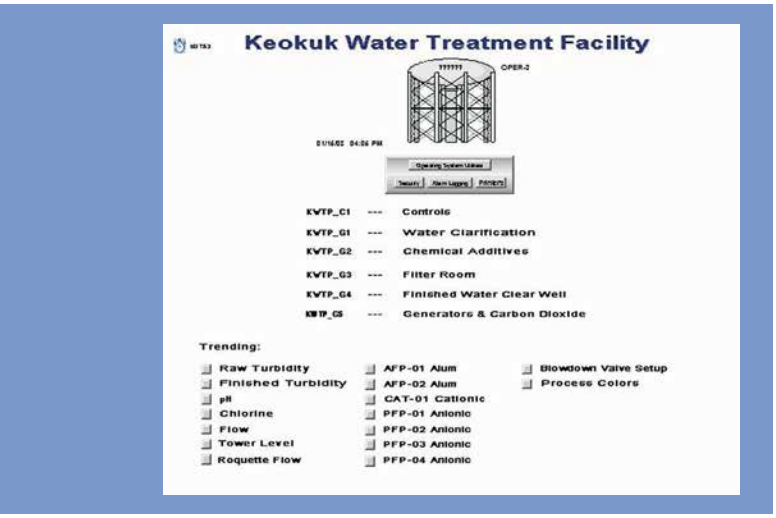
GENESIS64

Designed from the ground up to take maximum advantage of Windows 7, Windows Server 2008, .NET and SharePoint® technology. GENESIS64 is also "OPC-To-The-Core™," exemplifying the next generation of OPC Data Access, OPC Alarm and Events and OPC Historical Data Access. This allows for secure, open connectivity from plants and facilities to the enterprise level.

Water Pumps at Keokuk Municipal Water Works

Keokuk Municipal Water Works

Keokuk, Iowa



Keokuk Water Treatment Facility Main Menu

"The system has been in for many years, and it has been very reliable. The migration from the older version GraphWorX to the new has been a success. All aspects of the change-over from interfacing and gathering data from the Rotork Valve Package (Modbus) to the new OPC interface from ICONICS for the Allen Bradley PLC5 were completed in a timely manner with no downtime."

Bill Cole
General Manager
Keokuk Municipal Water Works

About Keokuk Municipal Water Works

Serving over 4,800 customers, Keokuk Municipal Water Works is responsible for providing its residential, commercial and industrial customers with a high-quality and reliable water supply. The Water Works service area, 105 miles of pipe within a 20-square-mile area, includes the entire incorporated area of the city of Keokuk, Iowa. Additionally, the water system serves two small private water systems outside the Keokuk corporate limits.

ICONICS Software Deployed

Keokuk Water has installed ICONICS GENESIS32™ after evaluating ICONICS, Wonderware and Intellution HMI software products. The GENESIS32 modules used are TrendWorX™32"and AlarmWorX™32. These ICONICS products were selected because of their cost effectiveness, ActiveX®-based technologies, ability to log data to Microsoft SQL Server, and local support. GENESIS32 replaces a stand-alone, proprietary system.

Project Summary

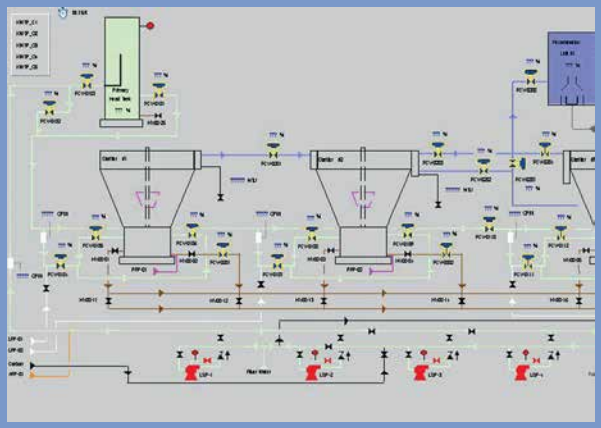
The GENESIS32 system monitors all functions of the plant, from analytical equipment to Rotork Valve: control, monitor, alarm, trend, etc. The GENESIS32 system connects to an Allen-Bradley Series 5 and MicroLogiX PLCs, Prolinx Hart Multiplexer, Rotork Valve System, Hach Analytical Equipment, Toshiba Drive Systems, and Rosemount Field Devices. The system has one Allen Bradley OPC Server, one alarm and trend server, and five Browser nodes. The system has 1,500 digital and 225 analog tags. The ICONICS GENESIS32 system connects via Modbus to the Rotork Valve Package.

The system provides better methods of data monitoring and alarm logging. It also provides much better visual representation of the water treatment process, with the browser nodes located strategically throughout the facility. The ICONICS 16-bit to 32-bit graphics translator made for a fast and easy upgrade from GENESIS™ for Windows version 3.5x to GENESIS32 version 6.x.

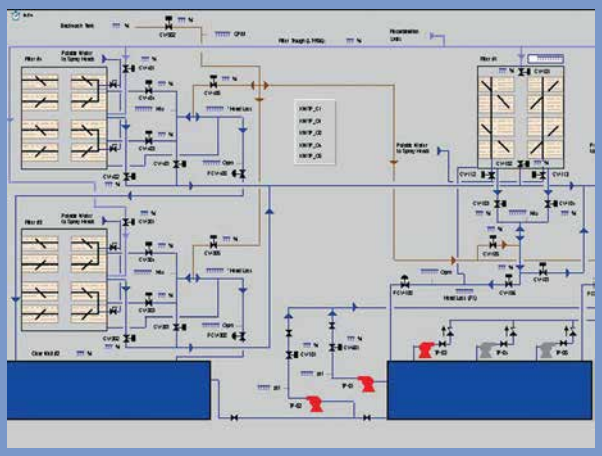
Project Overview

Several large centrifugal pumps move Mississippi river water (raw water) to the plant and into the head tank from the river. Prior to the head tank several chemicals, including oxidized soluble manganese, a liquid alum, a coagulate aid, cationic polymer, and carbon, are fed directly into the raw water.

After the raw water is mixed with the chemicals, it goes to four claricone Clarifier units where an anionic polymer can be fed directly into the top sludge blanket in the Clarifiers. Lime is also introduced at the bottom in a slurry form to remove the minerals that cause calcium hardness. The entrance velocity of the raw water promotes mixing within the vessel's lower cylinder. The slower rotation in the middle section provides good particle contact and flocculation. There is little turbulence in the top section of the claricone, which makes for good settling of the particles and produces clarified water. The water passes upward through the sludge blanket, which traps slowly settling particles that would otherwise pass through into the filters. The clarified water off the top of the claricones goes to the re-carbonation tank, and has a high pH and concentration of calcium carbonate. Carbon dioxide gas is added to the tank to form soluble calcium bicarbonate and to reduce the pH to a level at which the water is stabilized to prevent scale formation or corrosion of water pipes. The water is then gravity-fed into the filters. There are four sand filters used to remove what little particulate was not removed in the claricones. Chlorine is then added. After the water goes through the filters it enters the storage well. Here liquid ammonia is added to combine with the free available chlorine, forming a weaker form of disinfectant. The treated water is then pumped into the distribution system and to two elevated storage towers through one of four high service pumps. All the plant control is achieved through the use of ICONICS GENESIS32 software.



Monitoring/Control Screen at Keokuk Municipal Water Works



Another Monitoring/Control Screen

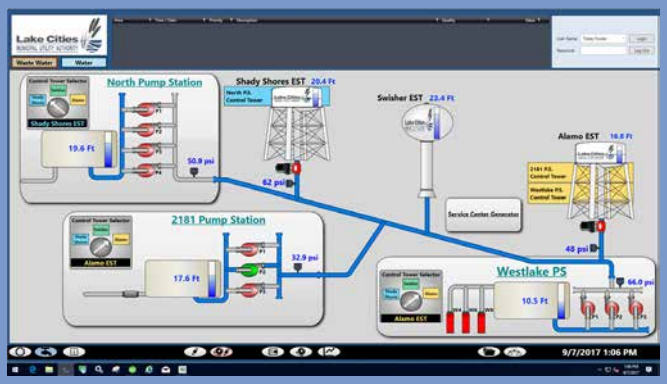
Conclusion

ICONICS has worked closely with Keokuk Water to make this project a success. Keokuk Water participates in the ICONICS SupportWorX™ maintenance program for upgrades and access to technical support.

Webb County Water Treatment Plant
Rio Bravo, Texas

Lake Cities Municipal Utility Authority

Lake Dallas, Texas



An LCMUA Monitoring Screen
Developed in GENESIS64™

About Lake Cities Municipal Utility Authority

Lake Cities Municipal Utility Authority (LCMUA) (http://lcmua.org), located in Lake Dallas, Texas, provides superior drinking water, fire protection and pressure, as well as maintains the goals within Texas Commission on Environmental Quality (TCEQ) standards in potable (drinking) water and sanitary sewer services. The authority covers the Shady Shores, Lake Dallas and Hickory Creek areas (together known as the Tri-Cities). LCMUA operates 21 lift stations, three elevated storage tanks, three ground storage tanks, ten pumps on the water side (with three altitude valves), and 46 sewer pumps on the wastewater side.

ICONICS Software Deployed

Lake Cities Municipal Utility Authority, working with system integrator WHECO Controls of Fort Worth, Texas (www.whecocontrols.com), selected ICONICS' GENESIS64™ HMI/SCADA suite with WebHMI™ web-based real-time automation software. LCMUA also selected ICONICS Hyper Historian™ high-speed, reliable, robust plant historian; MobileHMI™ data mobility suite; AlarmWorX™64 Multimedia OPC alarm management software; and ReportWorX™ enterprise reporting, charting and analysis software.

Project Summary

Lake Cities Municipal Utility Authority had an aging infrastructure system that needed help from top to bottom. Upgrading the system was one of the organization's biggest priorities, so that they could better maintain it. A large portion of LCMUA's budget at the time was being spent on call-outs, false alarms and failing equipment, so the authority sought solutions to reduce these related costs. One effort involved replacing their older SCADA system.

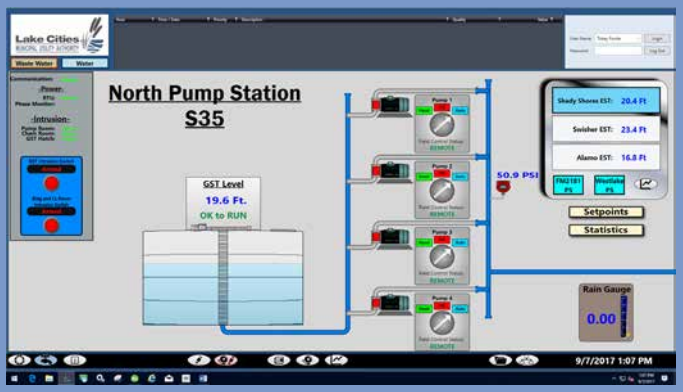
The pre-existing system was actually a combination of three competitor products, which ended up providing LCMUA personnel with three different sets of operating data. In addition to requiring a unified solution for their new HMI/SCADA, the authority also required one that could handle Distributed Network Protocol (DNP3) communications and interface with existing Servelec Technologies Tbox combined PLC/

RTU hardware installed at every lift station, pump station and elevated storage tank in their system.

Benefits of the System

LCMUA immediately realized the benefits to selecting ICONICS solutions. With GENESIS64, they achieved improved secure visualization of water and sewer levels, as well as monitoring and control of potable water and wastewater, elevation, PSI, intrusion pumps, pump monitors/controls, pump failure status, and temperature. In addition to the new graphic displays and trends, the authority their data mobility to have a "very fast response time", all of which were vast improvements compared to their previous system.

LCMUA considers that their new ICONICS automation software has made employees' lives easier as there are less calls asking if the alarms being seen are real or false. Managers can spend their time more wisely, managing team resources according to real-time data and thereby optimizing efficiency, improving response times and reducing downtime.



LCMUA Pump Station Monitoring and Control Display

Lake Cities Municipal Utility Authority OnCall Monitoring

appreciated the new alarms and notifications provided through ICONICS AlarmWorX64 Multimedia, including voice and text alerts.

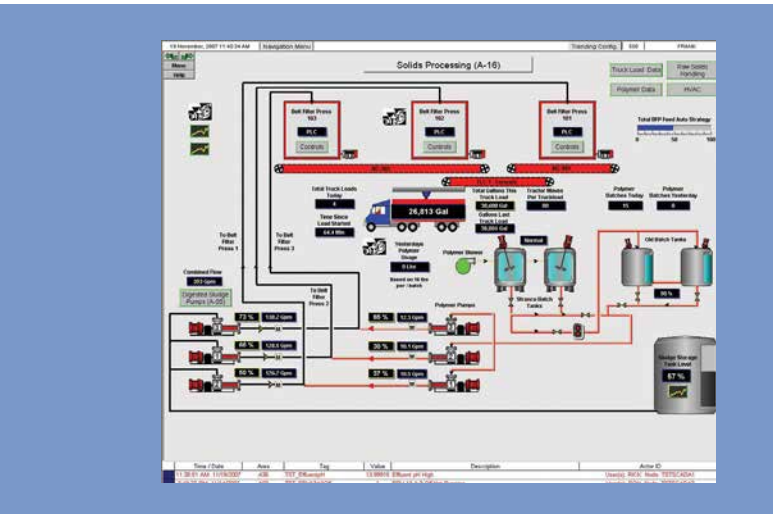
Lake Cities Municipal Utility Authority required a new HMI/SCADA system that would meet their needs for quality and maintenance within their water and wastewater system without any of the issues or data discrepancies they had experienced with their previous system. LCMUA also appreciated the fact that ICONICS' WebHMI and MobileHMI software enabled them to monitor and control connected systems through "Any Glass", as many of the organization's operators utilize iPads in the field. The authority now considers their visualization to be "top notch", their alarming to be "solid", and

Conclusion

Now that Lake Cities Municipal Utility Authority has seen what ICONICS automation software can do, they anticipate expanding their alarming and notifications using MobileHMI. Rather than continuing to maintain a disparate, obsolete system, LCMUA made an investment in ICONICS solutions that allows the water utility to clearly plan their future.

Lincoln Wastewater System
Lincoln, Nebraska

Lincoln Wastewater System's Northeast Treatment Plant



Solids Processing Screen

> *"ICONICS GENESIS32 is a very powerful and easily configurable control platform. I have no problems with any of the suite components. The integration of scripting and expression editing provides much more power than I am used to."*
>
> **Frank Newell**
> Control Systems Support Specialist
> Lincoln Wastewater Services

About Lincoln Wastewater System

The Lincoln Wastewater System (LWWS), owned and operated by the City of Lincoln, Nebraska, provides a continuous and comprehensive effort to assure the proper collection and treatment of current and future wastewater flows and loads in an environmentally sound and cost effective manner that protects human health and the environment.

Underneath and throughout Lincoln are 970 miles of sanitary sewer lines and 14 pumping stations that keep the wastewater flowing to two municipal treatment plants. The Theresa Street Plant is located in the north central section of the City and Northeast Wastewater Treatment Plant is just south of Interstate 80 and east of Highway 77. The Theresa Street facility has a maximum capacity of 27 million gallons per day and on an average day presently treats about 18 million gallons of wastewater. The Northeast facility presently treats about 5.5 million gallons per day. That adds up to 23.5 million gallons of water per day running through the two treatment plants.

ICONICS Software Deployed

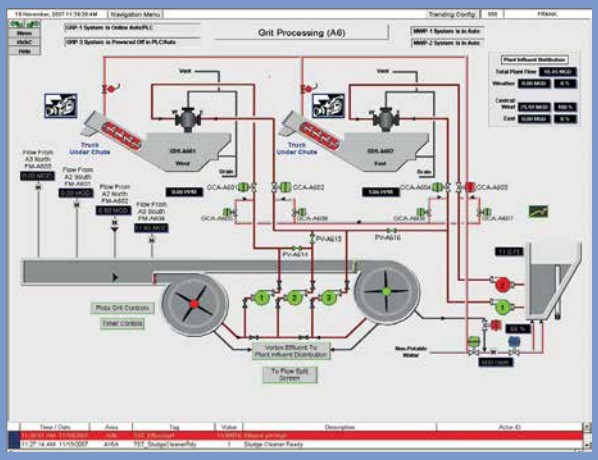
Lincoln Wastewater System installed ICONICS GENESIS32™ OPC Web-enabled HMI/SCADA suite and its WebHMI™ Web-based real-time automation component, as well as the BridgeWorX™ (real-time data bridging), ReportWorX™ (enterprise reporting/charting/analysis) and PortalWorX™ (real-time collaboration and visualization dashboards) components of ICONICS' BizViz™ manufacturing intelligence/business visualization suite.

Project Summary

ICONICS solutions were recommended through LWWS' system integrator, Olsson Associates (who

have offices in Lincoln). Lincoln Wastewater System has installed GENESIS32 server and multiple browser stations at each plant, joined together on the City's fiber optic network. Each plant is an activated sludge wastewater facility. The LWWS SCADA system controls all manual and automatic aspects of each process including raw water pumping, flow dispersal through different treatment trains, flow control to aeration basins and plant overflow bypass.
The system also controls aeration basin dissolved oxygen monitoring, mixed liquor suspended solids monitoring, return activated sludge flow set points/rates and effluent flow disinfection/totalization. The system also controls solid waste removal from the treatment facility. Although browsers access the local server, the LWWS application was configured so that in the event of one server failure, the other plant could provide basic graphics, alarming and trending for the other facility. WebHMI allows LWWS administrative staff to access graphics, alarming and trending from desktops on the City network. Trending via WebHMI has been especially useful to operations and maintenance managers. ICONICS BridgeWorX is used to log process information to a SQL Server database on a separate server for reporting. ReportWorX is used to create, print and e-mail daily process and equipment runtime reports to key personnel.

Data communications is handled through wired Ethernet within buildings and multimode fiber optics between buildings at each site, as well as radio communications to remote lift-stations and dedicated telephone lines to some remote lift-stations. ICONICS software interfaces with Allen-Bradley (SLC 5/05, MicroLogiX 1000 and 1100) and Wago (Modbus I/O) hardware and KEPware OPC Servers. Process accumulators, totalizers, averages and more are logged to SQL Server, while other data is shared with Microsoft Access and Oracle databases.



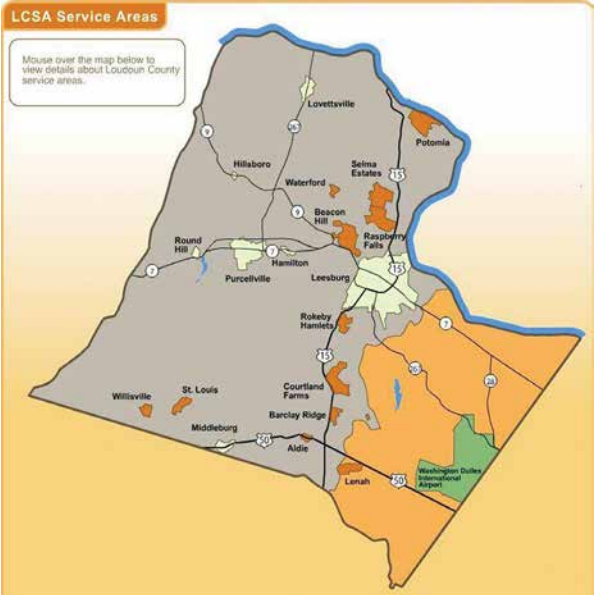
Grit Processing Screen

Anaerobic Digesters

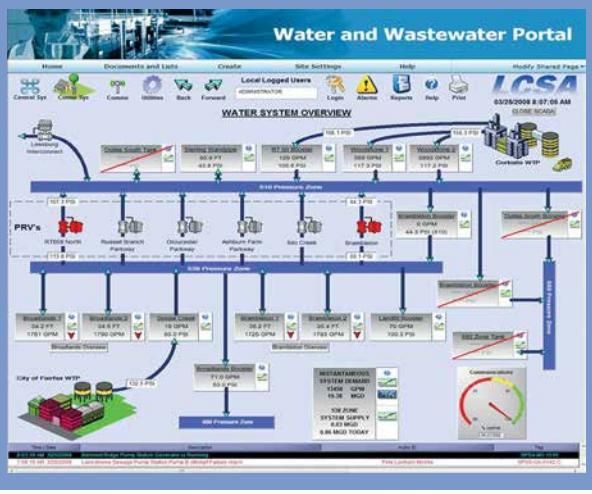
Conclusion

Lincoln Wastewater Service's new system provides monitoring and control of numerous pumps, valves, gates, wetwell levels and solid waste removal in a secure manner. The system also allows managers to monitor any functions that the operators monitor. LWWS was impressed by the ease and flexibility of ICONICS software's configuration, as well as with the open connectivity and open standards concepts of OPC technology.
Future projects involving ICONICS include integration of surveillance cameras, maintenance data and electronic lockout of equipment.

Loudoun Water
Ashburn, Virginia



Loudoun Water Service Area Map



Operator Overview Screen at Loudoun Water

> *"With the higher performance of Windows Vista, which is fully supported by our ICONICS software, we anticipate a reduction in customization time by 30 to 40%, compared with Windows XP."*
>
> **Andy Krapf**
> Supervisor of Instrumentation and Controls
> Loudoun Water

About Loudoun Water

Established in 1959, Loudoun Water, also known as Loudoun County Sanitation Authority, provides dependable, high-quality drinking water and wastewater reclamation services to the unincorporated areas of Loudoun County, Virginia. Loudoun Water controls and monitors its water distribution and wastewater treatment systems using HMI/SCADA applications. With these graphically rich, Web-enabled programs, Loudoun Water can view everything from flow animations and representations of pipes and valves to dashboards and control panels.

ICONICS Software Deployed

For several years, the utility's HMI/SCADA system has been based primarily on GENESIS32™ by ICONICS, a Microsoft Gold Certified Partner that develops industrial automation and manufacturing-intelligence software. Loudoun Water installed its HMI/SCADA software in an environment with 15 client computers running the Windows XP operating system connected to servers running the Windows Server 2003 operating system. Microsoft SQL Server 2005 data management software supports the HMI/SCADA applications by supplying them with information gathered in real time from the utility's industrial environment.

Although the Windows XP-based client computers served the utility's needs and were straightforward for the IT department to manage, Loudoun Water continually seeks ways to improve its industrial processes. It determined that high-performance 64-bit computers and applications - including a feature-rich, easier-to-use, 64-bit version of its ICONICS software, GENESIS64™ - would increase efficiency, and that the utility would need a newer operating system to support the upgrade.

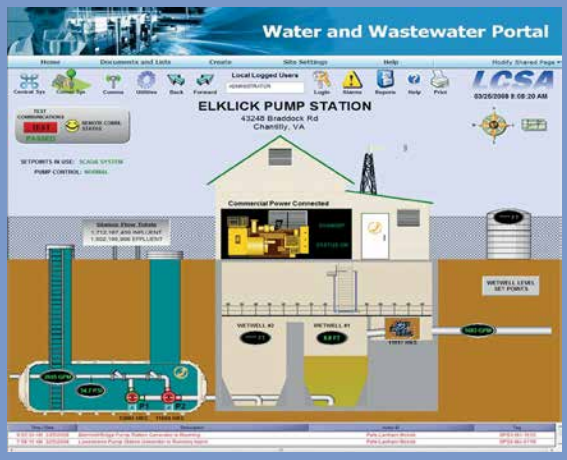
Project Summary

In February 2008, Loudoun Water began deploying the Windows Vista Ultimate client operating system and upgrading its HMI/SCADA software to include the GENESIS64 suite.

By upgrading to Windows Vista, Loudoun Water can run versions of its mission-critical industrial applications that fully support the newer operating system's advanced 64-bit architecture and richer graphical environment. As a result, these third-party applications are more flexible and easier to use, and they can be customized much faster.

Control to help reduce the risk of accidental or unauthorized system changes.

Additionally, Windows Vista comes with Microsoft .NET Framework version 3.0, which includes, among other technologies, Windows Presentation Foundation. Users at Loudoun Water are particularly impressed with the GENESIS64 user interface elements and 3-D graphics, which are now built on Windows Presentation Foundation.



Alarm Monitoring Screen for Elklick Pump Station at Loudoun Water

3D Model Visualization

Benefits of the System

The utility's HMI/SCADA applications running on Windows Vista include sophisticated features that would be more difficult to implement in a Windows XP–based environment. For example, the GENESIS64 suite uses Windows Vista Sidebar Gadgets as gauges, alarms, sliders, and other controls that utility employees can access more easily. The suite also uses enhanced Windows Error Reporting to gather information that can help identify and resolve program errors.

GENESIS64 exposes metadata and integrates with Windows Vista search technologies to help employees quickly locate information that the suite generates. The application also increases the IT security of Loudoun Water by integrating with User Account

Conclusion

The new versions of the utility's third-party applications take full advantage of the high performance 64-bit architecture of Windows Vista. As a result, tasks related to customizing the applications to match the industrial environment take less time. These tasks include 3-D modeling, laying out visual representations of pipes and flow systems, and so on.

Compared to previous versions, the upgraded software is easier to learn and use, runs faster, and can be faster to customize. With the higher performance of Windows Vista, which is fully supported by ICONICS software, Loudoun Water anticipates a reduction in customization time by 30 to 40 percent, compared with Windows XP.

City of Lubbock Water Utilities Department
Lubbock, Texas

Lake Meredith, Lubbock's Water Source

A View of Lubbock's Elevated Tanks

> *"The system was developed using ICONICS' OPC-based GENESIS32 packaged with WebHMI and ReportWorX software. This provided the flexibility and power we needed for a rapidly growing, multi-user SCADA system with diverse communication, control, alarming, trending and reporting requirements."*
>
> **David G. Converse**
> Business Unit Manager
> Wunderlich-Malec

About Lubbock Water Utilities

The city of Lubbock sits in the Texas panhandle on flatlands marked by aridity. In the dusty, drought-prone "hub of the plains," responsible water use is imperative. To meet demands of its growing population, Lubbock must get its water from multiple sources. Lake Meredith and groundwater from aquifers serve as primary sources, while well-fields, operated by the Canadian River Water Authority, supplement supply in times of peak demand. Lubbock Water Utilities Department manages all facets of the city's water needs, including water collection, water and wastewater treatment.

With a new water and wastewater software solution from ICONICS, installed by Wunderlich-Malec, Lubbock Water Utilities is able to provide the best water and reclamation service possible with the resources available.

ICONICS Software Deployed

GENESIS32™ provides a Web-enabled HMI/SCADA solution to Lubbock's water and wastewater facilities. TrendWorX™32, ReportWorX™32 and AlarmWorX™32 components are used for data storage, trending and alarming functions.

Project Summary

ICONICS' GENESIS32 system provides for the monitoring and control of all aspects of Lubbock's water treatment plant, wastewater treatment plant and well-field.

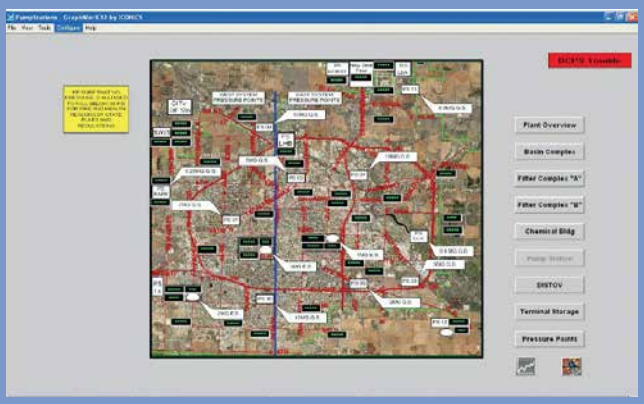
Each of the locations has its own control room with several operator stations running on WebHMI. Through custom console panels designed by Wunderlich-Malec, operators use ICONICS to monitor values and controls.

At the water and wastewater treatment plants, chlorine, turbidity, suspended solids, oxidation-reduction potential (ORP) and other critical process variables are monitored. Plant data is acquired via OPC interfaces with plant programmable logic controllers (PLCs). Data from the water distribution system is acquired over a radio telemetry system.

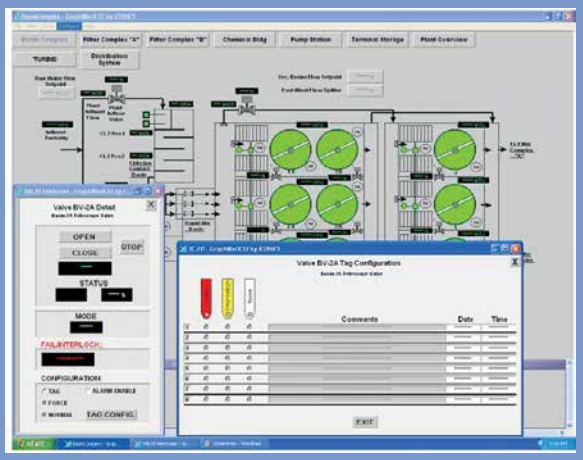
Besides graphical interfacing, ICONICS provides Lubbock Water Utilities with trending, reporting and alarming. Alarming allows plant operators to respond to and identify critical problems as they arise, saving time and money. Trending and reporting offers efficient data analysis.

Conclusion

ICONICS, in partnership with Wunderlich-Malec, provides the growing city of Lubbock with an efficient water management solution. Lubbock is currently implementing a state-of-the-art treatment process at their water reclamation facility. The ICONICS-based SCADA system is integral for efficient operation of the plant.



Lubbock's Pump Stations



Basin Complex View

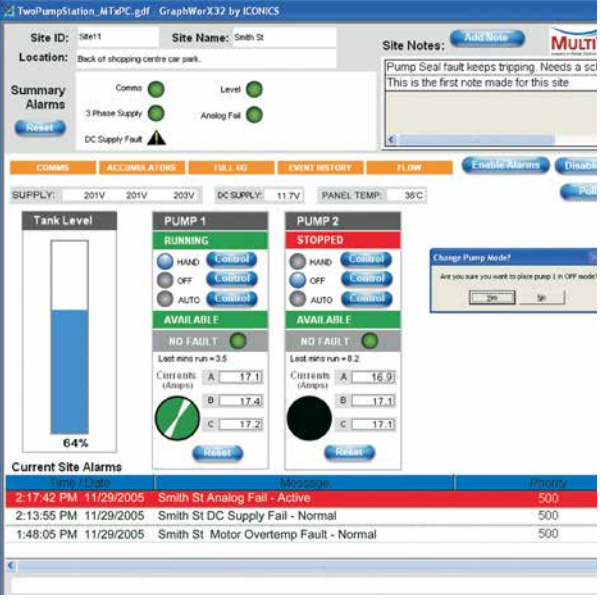
Solutions Highlighted

TrendWorX
Data Logging, Charting and Reporting Software

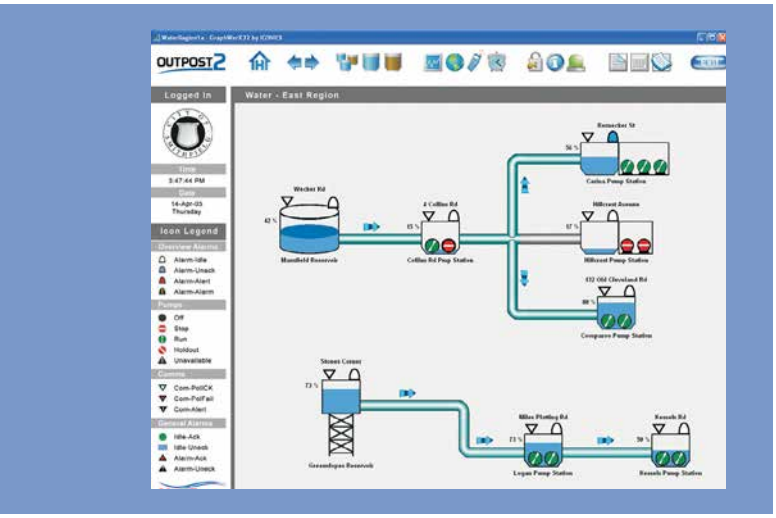
ReportWorX
Enterprise Reporting, Charting and Analysis Software

AlarmWorX
Multimedia OPC Alarm Management Software

MultiTrode
Queensland, Australia/ Boca Raton, Florida



Typical 2-Pump Station Example in MultiTrode's Outpost 2



Hydraulic Overview Screen Example

"GENESIS32 from ICONICS provides ease of use and open connectivity and allows us to produce a robust Outpost 2 SCADA system for our water/wastewater customers."

Steve Carson
Vice President of Marketing
MultiTrode

About MultiTrode

MultiTrode are "innovators in pump station management systems, municipal SCADA and level sensing". The ISO9001 company designs and manufactures pump station controllers, RTUs, liquid level sensors, SCADA software and Web-based monitoring and control. MultiTrode has remained dedicated to providing technically advanced, yet simple to use, solutions to municipal water and wastewater authorities around the world for over twenty years.

MultiTrode's Outpost 2 product is an open and powerful SCADA system designed for the water/wastewater industry. Outpost 2 interfaces directly to MultiTrode pump controllers and RTUs and provides a wealth of valuable information from every site.

ICONICS Software Deployed

Outpost 2 is built on a proven platform, the GENESIS32™ OPC Web-enabled HMI/SCADA suite from ICONICS.

Project Summary

The MultiTrode SCADA product range has been designed specifically for the needs of water and wastewater networks, and includes:

- **SCADA** - the graphical interface, alarming & trending
- **Historian** - the datastore and reporting interface
- **MTU** - the master telemetry unit, which communicates with the field hardware
- **RTU** - the remote telemetry units, or field hardware

Some water and wastewater applications that benefit from visualization, monitoring, reporting and analysis solutions include:

- Water Utilities, Municipalities, Distribution Systems
- Sanitation Systems
- Water Filtration and Remediation, and More.

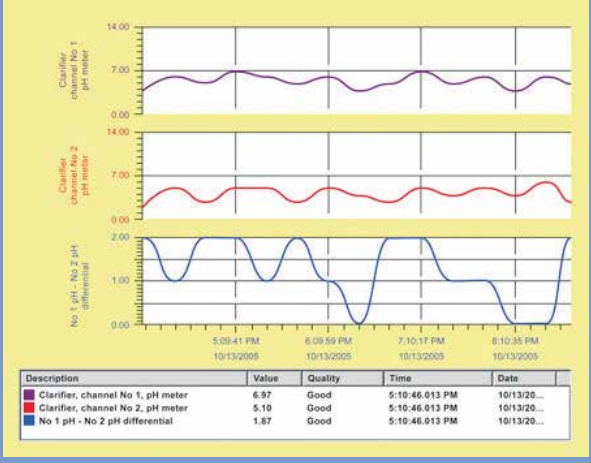
Benefits of the System

SCADA systems usually consist of graphic screens (the HMI [human machine interface]), trends, alarms and reporting and GENESIS32 is no exception. The Outpost 2 system demonstrates a lot of the basic capabilities of GENESIS32. More advanced users may appreciate multiple other features of GENESIS32 such as drag and drop ActiveX controls for trends and alarms. Users can go into configuration mode, drag an alarm ActiveX onto a page and go back into runtime mode in a few seconds. The same can be done with trend screens.

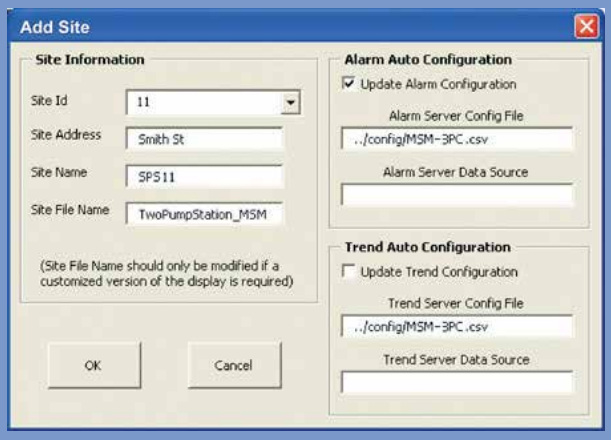
Data points on a screen can be simply dragged onto a trends window to instantly start trending. Alternatively, users can browse through OPC tags and select the ones that are required. Historical tags can be selected just as easily. And all this can be done while the SCADA system is running.

Customers can also benefit from additional ICONICS modules for:

- PDAs (via PocketGENESIS™)
- Mobile Phones (via MobileHMI™)
- Advanced Reporting (via ReportWorX™)
- Web-based Organization Portals (via PortalWorX™)
- Visual OEE/KPIs/Analysis (via BizViz™ Productivity Analytics)



Sample Trend Screen



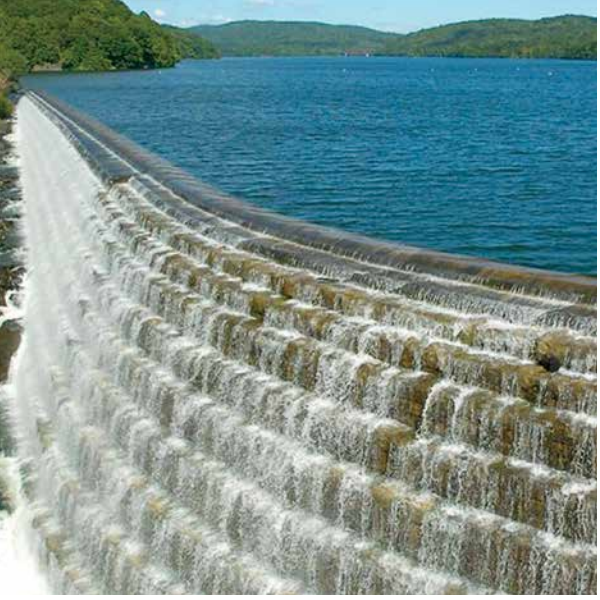
Add Site Screen

Case Study Details

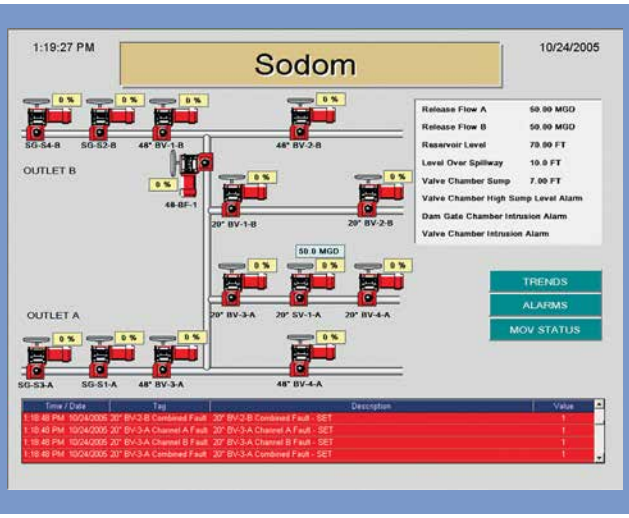
The MultiTrode/ICONICS SCADA product range achieves three key objectives:

- **Low Lifetime Cost** - a system which a typical organization can operate and expand themselves
- **Low Operational Cost** - provides a system which reduces operational and engineering costs by minimizing the need for site visits while improving asset performance
- **Open Systems and Protocols** - the organization can choose to use whatever products they like from MultiTrode, as well as products from other suppliers such as ICONICS - without having to invest in overcoming proprietary interfaces

New York Reservoirs and Dams
Westchester County, New York



New Croton Dam in Westchester County, NY
Holds up to 19 Billion Gallons of Water



Main Control Screen at Sodom Dam

"GENESIS32 is being used to help ensure a primary source of water for millions of people in New York City."

Gabe Hauer
AdvanTech Corporation

ICONICS Software Deployed

NYCDEP, through the suggestion of system integrator, AdvanTech Corporation, selected ICONICS' GENESIS32 Web-enabled, OPC-integrated HMI/SCADA suite to perform the various control and monitoring tasks at each separate dam and reservoir location.

About New York Reservoirs and Dams

Over eight million residents and visitors of New York City depend upon a combination of tunnels, aqueducts, dams and reservoirs located throughout New York State for their water needs. Three separate systems comprise the water supply for the city, including the Catskill System, the Delaware River System and the Croton System. In recent years, the New York City Department of Environmental Protection (NYCDEP) has taken on a project to expand and modernize the Croton System, including the use of automated monitoring and control of dams and reservoirs within the Croton System, including Croton Dam, Croton Diverting Dam, Sodom Dam, Bog Dam and Middle Branch Dam.

Project Summary

The New York City Department of Environmental Protection began a project in the early 2000s to monitor and control water levels in a number of dam-reservoirs throughout the New Croton Aqueduct. Each reservoir/dam has its own separate control room, containing its own instrumentation and controls. AdvanTech was selected to provide autonomous PC-based automation of the water level monitoring and control and, in turn, recommended ICONICS' industrial automation software. The project involves communication with a series of valves and gates within the reservoirs, each connected to an actuator. NYCDEP mandated in its project specification that the actuators for the valves and gates communicate via MODBUS protocol. The agency also required that MODBUS communicate throughout each

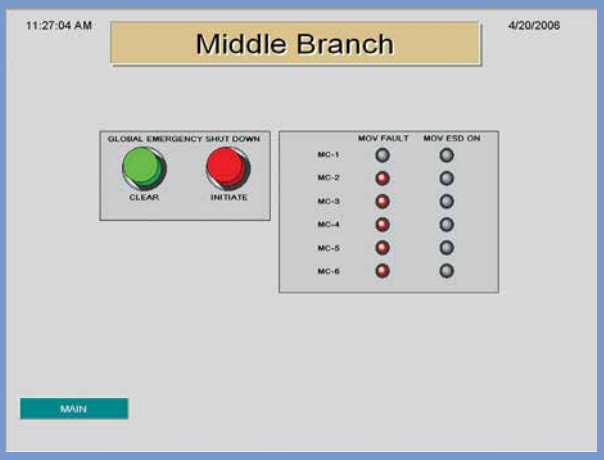
reservoir/dam's control system in a loop, something for which MODBUS wasn't designed to do natively.

Two PLCs (Schneider Electric) are attached to each valve to connect into the looped system, and are networked via Ethernet to the GENESIS32 HMI/SCADA system. AdvanTech designed the system so the actuators could be controlled via each reservoir/dam's master station control.

Benefits of the System

GENESIS32 met NYCDEP's requirements in modernizing its reservoir/dam monitoring and control due to:

- Integration with multiple communication protocols and technologies such as MODBUS and Ethernet
- Monitoring of standalone applications, such as remote water level control rooms
- PC-based HMI/SCADA (whether industrial or traditional) and integration with Microsoft operating systems and applications



A Status Screen at Middle Branch Reservoir, Part of the Croton Water System in New York

Water from the New Croton Reservoir Travels 24 Miles Before Entering NYC Via the Bronx

Key Features

ICONICS' GENESIS32 HMI/SCADA is installed at each separate reservoir/dam control room on a dedicated function industrial PC. The software has been set to collect historical data and run without on-site interaction over set periods of time. It also ties in seamlessly with the PC's operating system (Windows XP) and database software (SQL Server). GENESIS32 can be monitored remotely, where operators can get detailed visualization of data related to:

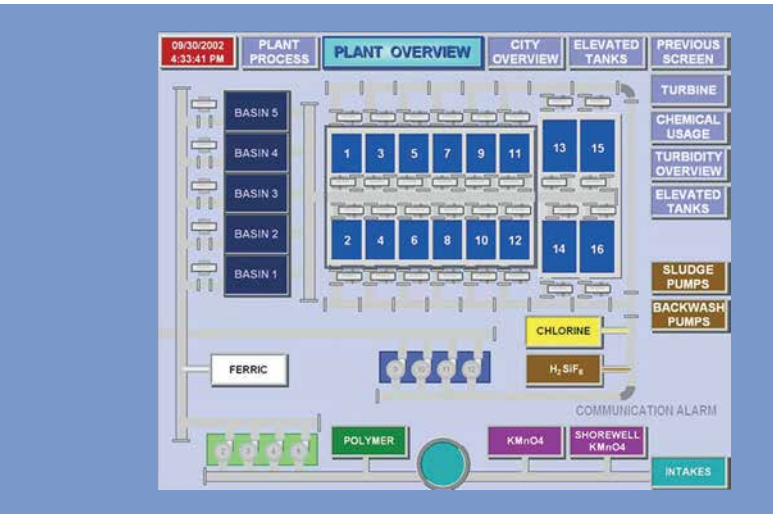
- Valve Actuator Status
- Electric-related Activities
- Motor-related Activities
- Water Levels
- Water Pressure

Conclusion

NYCDEP's Croton System reservoir/dam project is still ongoing, with GENESIS32 installed at six fully operational control room sites and two currently in process (as of May, 2009). ICONICS is honored to be selected in ensuring an adequate water supply for one of the most populous cities on Earth.

Sunrise at Racine, WI

Racine Water & Wastewater Utility
Racine, Wisconsin



Plant Overview Screen at Racine Water

> *"While there are so many new tools and capabilities in the GENESIS32™ product, the one outstanding feature is the ability to add, delete and change data tags while the system is online and functioning."*
>
> **Bob Gilbreath**
> Computer, Control & Instrumentation Supervisor
> Racine Water & Wastewater Utilities

About Racine Water & Wastewater Utilities

Racine Water & Wastewater Utilities serves 100,000 customers in the communities around Racine, Wisconsin. They have two facilities located on the shores of Lake Michigan in Southeastern Wisconsin. Their water utility processes an average of 35 million gallons of potable water per day for their residential, commercial and industrial customers. Their wastewater utility treats approximately 35 million gallons of wastewater per day before returning it to Lake Michigan.

ICONICS Software Deployed

ICONICS' GENESIS32™ HMI/SCADA software suite (GraphWorX™32, TrendWorX™32, AlarmWorX™32 and ScriptWorX™32) is being utilized for the main visualization, data storage and alarming functions. DataWorX™32 is also being used for system-wide redundancy. Another option being deployed is advanced data-logging to Microsoft MSDE database through the ICONICS MSDE data-logging option.

Key Features

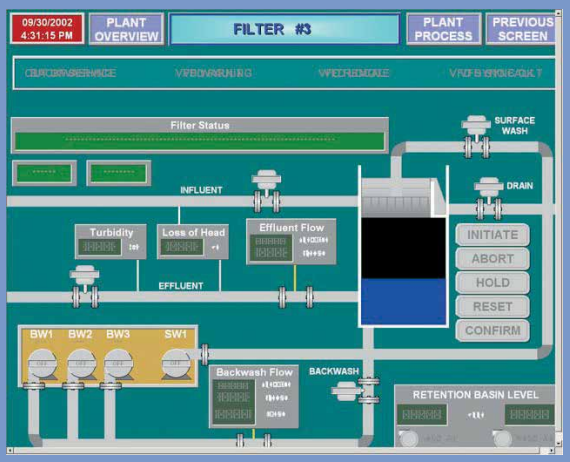
Racine Water initially chose GENESIS for DOS in 1991 as the HMI operator interface software for their plant wide SCADA system at their water utility. This system controlled the entire water plant and distribution system operation of 3 remote tanks and 1 remote pumping station, from a central control room. There were seven PCs installed in the control room and around the plant to monitor the water filtration process.

A year later, a citywide SCADA radio telemetry system was installed at the wastewater utility to monitor 11 lift stations, 4 metering sites and 10 safety

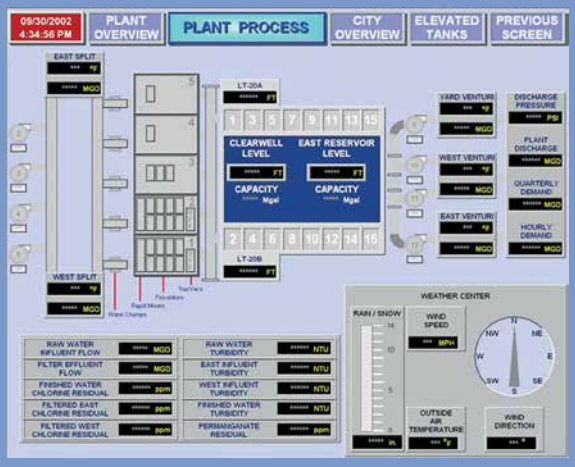
sites. In 1996, the system was upgraded to GENESIS for Windows and in 2001 the wastewater plant was modernized using GENESIS32™ to increase capacity and to automate and centralize the control to one room. An extensive evaluation was made of leading SCADA vendors. GENESIS32™ was selected because of the speed and redundancy of data collection systems, as well as due to the superior OPC-based data engine allowing live changes to the system without the need to restart.

Benefits of the System

Since both the water and wastewater operations are running 24/7, system stability, reliability, redundancy and the ability to update the data engine live are critical to the proper operations at each location. The SCADA system was installed by in-house personnel and managed by Bob Gilbreath. The GENESIS32™ system provides for the monitoring and control of all aspects of the water filtration and citywide distribution processes of the water utility.



Filter Monitoring and Control at Racine Water & Wastewater



Plant Process Monitoring/Control Screen

Project Summary

At the water filtration plant, five workstations are used for process visualization, control, alarming and historical trending. Three operator workstations at other remote locations in the plant provide remote viewing, control and alarm acknowledgement. Two data servers are also being used for data collection and historical data logging. At the wastewater plant, a central control room is utilized with five workstations as well as another ten operator workstations located around the facility. At the largest lift station, a single system is installed to monitor and control 15 pumps, as well as the logging of process and alarm data.

At the wastewater plants' field operations office, the system is used for monitoring and alarming the status of the remote sites. At the Lift Station #1, the GENESIS32™ system is used for monitoring and control of the station operation. There are over 1500 total data tags at the water filtration plant and 1300 tags at the wastewater plant which will be expanded to over 2,000 tags after final improvements are completed. Particle counter data is also collected using a Hach (another ICONICS OEM) GENESIS32™-based software system.

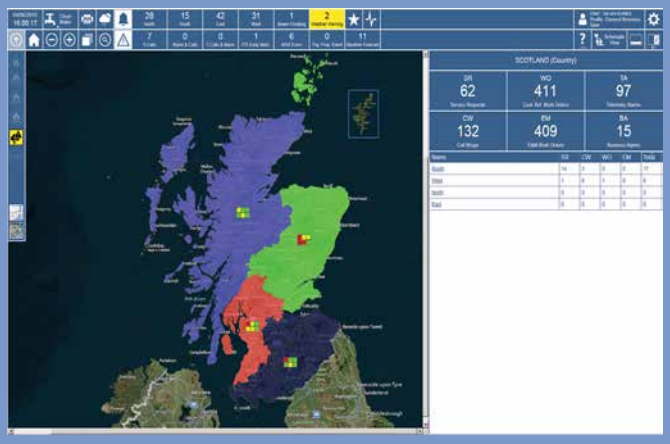
Conclusion

Together, Racine Water & Wastewater Utilities and ICONICS have produced clean and pure water for many years to the good people of Racine, Wisconsin.

Reservoir at Edinburgh, Scotland

Scottish Water
Scotland

Scottish Water



The Situational Awareness Application

"While we continue to develop our Situational Awareness system, we have already seen significant benefits through the early identification of business events and thus the protection of our service to our customers. As we move forward, the functionality developed to date will not only continue to improve our reactive response, but fully support the delivery of a more proactive service from our ICC to both our internal and external customers."

Bernie Rodden
Manager of the ICC

Introduction/Overview Synopsis

Scottish Water provides clean, safe and high quality drinking water to 2.5 million households and 156,000 business premises across Scotland. Every day, they provide 1.35 billion litres of clear, fresh drinking water and take away 945 million litres of waste water, which they treat before returning to the environment. In 2010, Scottish Water established an Intelligent Control Centre (ICC) to serve as their central hub for all their operational activities across Scotland. The vision was that the ICC would allow Scottish Water to respond in a timely and effective manner to emerging business events to minimise risk and impact on both the customer and Scottish Water.

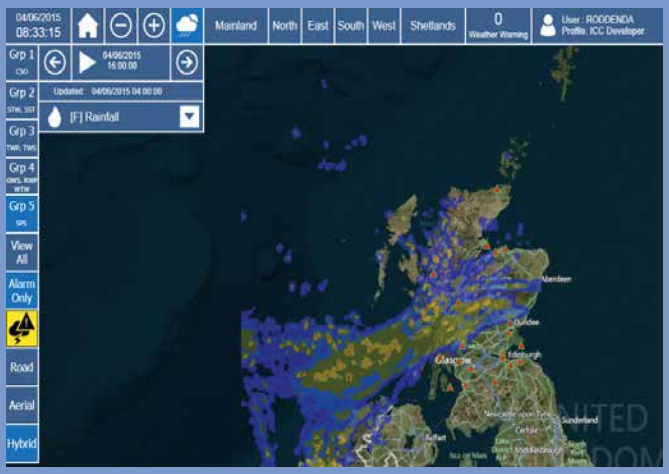
In order to achieve this vision Scottish Water engaged with ICONICS with the goal of building a solution that would revolutionize the way in which they could understand business events and ensure effective response arrangements for many years to come.

A number of options were considered by the ICC to achieve this goal, ranging from replacement of existing telemetry systems to procurement of a new integrated solution—with the clear aims of supporting Scottish Waters Overall Performance Assessment (OPA) measure and enhancing the management of business events. By applying an "Internet of Things meets Big Data" approach, the ICC Team devised a data-driven software solution based upon ICONICS GENESIS64™ software that supports Scottish Water on its journey to becoming a trusted and leading organisation in Scotland. Scottish Water is now in a better position to understand its

data and respond effectively to customer service events throughout the country.

The 'Situational Awareness' application has been so successful that Scottish Water and ICONICS are now helping operational teams around the world to consider implementing a similar data-driven solution. This system intelligently combines and displays telemetry, customer contacts, weather data, fleet and work management into a single integrated view, combining thousands of events and monitoring hundreds of thousands of data points per week.

Scottish Water Call Centre



Live Weather Data with Business Alarms

That data, supported by business rules and logic, has given the team deep insights, enabled better diagnostics, and has allowed for far more intelligent customer-focused decisions.

The ICC's Business Problems

Bernie Rodden, Manager of the ICC explained to us that, "At the commencement of the ICC, Scottish Water had a number of key aims associated with the development of our Situational Awareness requirements including:

1. The ability to improve the speed of identification of various business risks that had the potential to impact on the service to our customers.
2. Ensuring we had the capability to link various sources of business intelligence including telemetry, customer, weather and workflow activity data, etc. to support the early identification and response to, business events.
3. Having a system that was flexible enough to both develop and enhance in house to meet future business needs."

The ICC's success has, to date, been measured by their ability to influence a number of business problems including:

- Protection of OPA points, particularly in relation to Interruption to Supply (ITS) events.
- Support the delivery of operational efficiency costs (£3.8 Million).
- Support the attainment of the Customer Experience Measure (CEM) target.
- Provide the ability to proactively intervene or solve 'interruptions to supply' within 6 hours. In other words, to ensure that all premises across Scotland do not experience unplanned interruptions to supply lasting more than 6 hours.

Historically in order for the ICC to gain an understanding of the events occurring in an operational area information needed to be manually checked and consolidated from a number of disparate systems. As with any manual intervention this has a greater chance for human error to occur, with decisions taking longer to be reached and/or being potentially based on incomplete information.

The Vision and Selection of ICONICS

The development of Situational Awareness was very much an evolutionary process that started back in

2012 when Scottish Water decided to upgrade their water network schematics. At the time, the team needed some way of connecting their new state-of-the-art schematics with their customer and enterprise data. Remember, one of the key goals of the ICC was to reduce risk to service. A key aspect to this is understanding the link between the performance of SW assets and customer service as these are seen as key factors in the decision making process.

A high level set of approximately 50 capabilities went out to market and 10 leading suppliers were whittled down to a handful of providers. But the truth is, no one could really do everything that Scottish Water wanted. Based on Scottish Waters evaluation of the market they updated their initial focus in order to maximize business benefit based on the capabilities of the available solutions. As result, ICONICS was chosen based on the agility, power and connectivity capabilities of their product suite.

The set of 50 capabilities evolved into 150 requirements, which became known as 'Phase 0'. ICC staff no longer needed to switch between multiple systems to try to establish the root cause of a problem. No, after Phase 0, the ICC team were able to view all their enriched network schematics overlaid with real-time customer data and business rules. True holistic decision making suddenly became possible. The potential was huge!

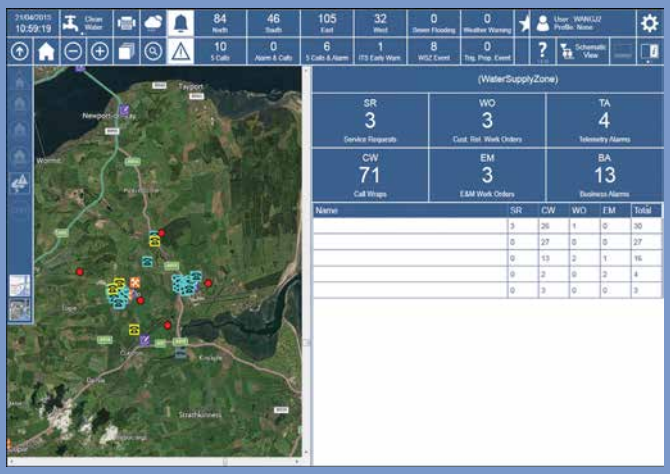
Phase 1 and the Benefits of SA

The ICC team had managed to tie the elusive gap between 'the event' and 'the customer', but they weren't finished there. While Phase 0 was busy being deployed, the ICC and the ICONICS consultancy team had already made plans for a second phase, 'Phase 1'. At this point, Phase 0 had already proven the simplicity of building an ICONICS-based solution.

"It was clear to us that the simplistic nature of the tool set and available functionality would enable the flexibility to drive a range of business improvements aimed at enhancing the service and experience provided to our customers" Bernie Rodden stated. This was clearly illustrated by the ability of the ICC to quickly create schematics and displays to aid in monitoring key areas for such high profile events such as the Commonwealth Games, the Ryder Cup, Open Golf and Edinburgh Marathon.

The concept for Phase 1 was based around an even bigger question: 'Now that we know the relationship between events and customers, how do we proactively prevent events from happening?' While Phase 0 delivered schematics enriched with customer and work activities, the ICC identified that the key to answering this question was the creation of a geospatial display to show events as they occur, and which uses reference information to create a 'complete picture'. In addition to the information displayed as Phase 0,

ICC Team Members Evaluating Requirements



Geospatial View Displaying Real-time Customer Data with Alarms

the ICC also looked to develop the capabilities of the system further and obtain additional benefits by also integrating; current, forecast and weather warnings from the Met Office; Scottish Water's telematics system (Masternaut); the display of Operational zone boundaries and also including events from the Operations Log (used to monitor both planned and unplanned work along with its ITS implications).

The idea became a plan, and the plan became reality, but not before Scottish Water enquired about splitting the Phase into two deliverables to maximize benefits quickly. So why split the delivery of Phase 1? Well, one of the largest multi-sport events across the British Commonwealth returned to Scotland for the first time in 28 years in 2014; the Commonwealth Games. To ensure that everything ran smoothly for Scottish Water and its customers during this prestigious event, Scottish Water asked if Phase 1, Release 1, could be completed specifically ahead of Glasgow 2014. ICONICS was agile enough to accommodate their needs and deliver an initial core function version, on time and of high quality.

Situational Awareness has allowed Scottish Water to not only respond more quickly and more effectively to the needs of their customers, but it's given them the ability to proactively respond to scenarios where their assets or customers may potentially have been detrimentally affected. Let's take the example of flooding. By taking live telemetry of sewer levels and associating this with the anticipated Met Office precipitation levels, preventive flooding action can be taken and staff deployed to mitigate customer impact.

Sometimes, of course, it's not possible to predict where and when events are likely to emerge from; for example, if a water main bursts. This is where the solution has truly added value. Amongst other data sources and business rules, by allowing alarms to interact with customer call information geo-spatially, Scottish Water can use this solution to help identify the source problem of hundreds of alarms or customer calls. This can, and will, fundamentally help Scottish Water.

Danny Rodden, Duty Manager, Using the SA Application

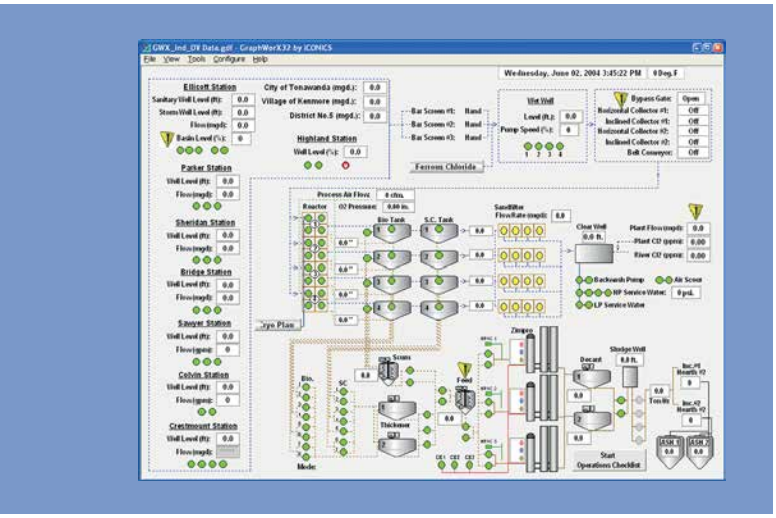
Plant Workers

The potential and expectations now in Scottish Water just keep growing. The evolutionary process of the Situational Awareness project looks to continue. The ICC have upcoming plans to integrate more telemetry systems and to develop a live management dashboard. The more long-term thinking lies around mobility and linking weather forecasts into their business rule logic. There are many potential opportunities to add further intelligence to the system, and just as importantly the ability exists to customise and develop a number of these capabilities within the ICC in order to further enhance customer service.

Tonawanda Water Resource Department

Tonawanda, New York

Water Tower
Tonawanda, NY



Wastewater System Overview Screen

> *"ICONICS was able to reduce our operational cost while providing us with technology we can grow with."*
>
> **Ed Rick**
> System Manager
> Town Of Tonawanda Water Resource Dept.

About Tonawanda Water Resource Dept.

The Town of Tonawanda, formed in 1836, is located north of Buffalo, with a population of approximately 80,000. The Water Resource Department operates and maintains hundreds of miles of water and sewer lines. Each year billions of gallons of water drawn from the Niagara River are treated, distributed, collected and cleaned in order to serve their residents. The name Tonawanda, or "Swift Waters," was given to the area by the original Native American inhabitants.

ICONICS Software Deployed

GENESIS32™ Enterprise Edition and WebHMI™ are deployed at both the Water and the Wastewater Treatment Facilities. Between both locations there are five GENESIS32 servers, five WebHMI servers, and numerous dedicated and browser-based clients. DataWorX™32 plays an important role in the application, allowing the Water Treatment Facility's server to act as the backup server for the Wastewater Treatment Facility, and visa versa. Both applications take full advantage of the power of GraphWorX™32, providing rich and informative operator screens. TrendWorX™32 is deployed, providing operators with real-time trending. AlarmWorX™32 Multimedia is used to distribute alarms and events to the appropriate people.

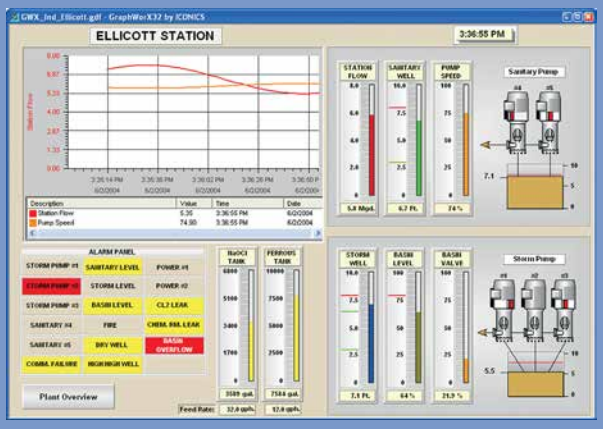
ICONICS software is also deployed at 13 remote pumping stations connected over leased lines back to the control room.

Project Summary

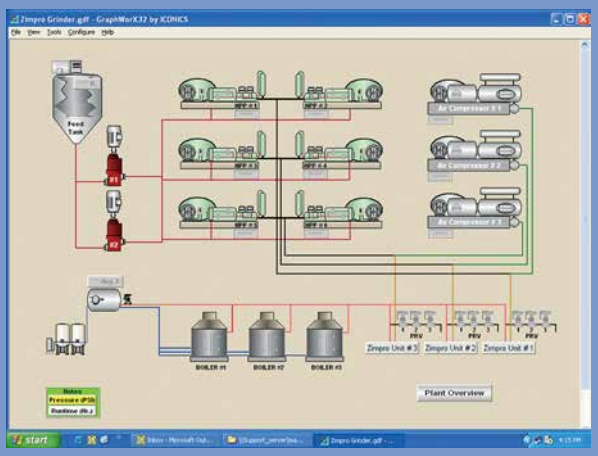
ICONICS software replaced a legacy competitor HMI/SCADA application when the price for support became too high. The Town of Tonawanda was paying high support cost for the HMI/SCADA package and other third-party applications such as reporting solutions. Switching to ICONICS paid for itself in the first year. For the price of one year of support,

GENESIS32 and WebHMI were installed on a 32-bit platform at a lower cost, providing more technology such as the ability to have true thin-client viewing via Internet Explorer Web browsers.

The system was installed by town employees, with sales and technical support from BCS in Buffalo, NY. OPC technology and redundancy both play a significant role in the application. Kepware OPC drivers are used to connect GENESIS32 to Modicon PLCs and Industrial Control Links Devices. The system has approximately 4,000 I/O points in total.



Ellicott Station Monitoring Control at Tonawanda Water Resource Department



Zimpro Flow Screen

Redundancy is performed at three levels. There are redundant Enterprise servers in each location, and each location works as a backup for the other. There is a wireless Ethernet between the locations running over a Cisco backbone. DataWorX32 Redundancy is used to keep the plants in sync. There are redundant OPC drivers in use, as well as redundant Ethernet with a recovery time of less than 300 milliseconds.

Benefits of the System

Deploying ICONICS software lowered the expensive support costs to keep the legacy systems running. The upgrade also gave the Town of Tonawanda a system they can expand on for years. They have the architecture that supports additional functionality, such as wireless operator stations, the ability to stay connected via mobile phones, and more. In addition to lowering their support cost for the maintenance contracts, time spent supporting the system internally is now minimal.

WebHMI is a true thin-client solution with all the administration and licensing done on the server. With client-side licensing, staying connected to the plant can be done anywhere, anytime. All that is needed are a user name and password.

Conclusion

The Town of Tonawanda is continuing to retrofit ICONICS software solutions and soon will deploy ReportWorX™ as their reporting standard.

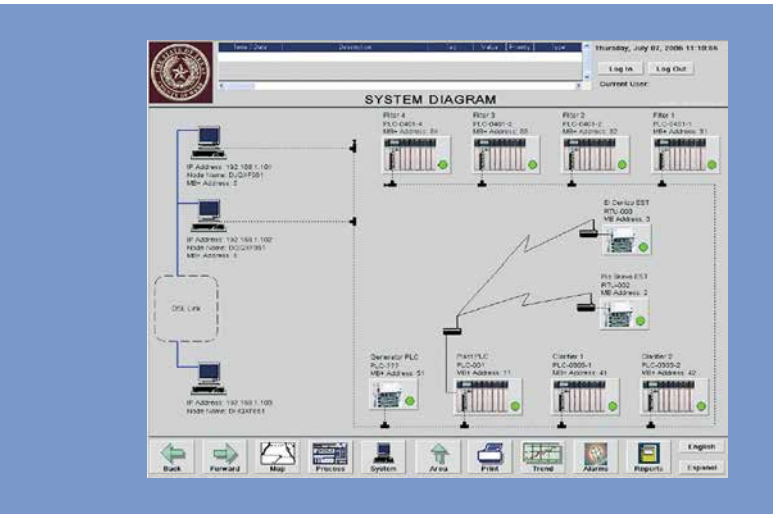
Solutions Highlighted

WebHMI
Web-Based Real-Time Automation Software

DataWorX
OPC Data Aggregation, Bridging, Redundancy and Tunneling

Webb County Water Treatment
Rio Bravo, Texas

Webb County Water Treatment Plant
Rio Bravo, Texas



Control Systems Architecture

About Webb County Water Treatment

The Webb County Water Treatment Plant (WTP) in Rio Bravo, Texas is situated near the Rio Grande River, south of San Antonio. In order to meet population growth and to respond to rising water quality requirements, the county planned to construct a new plant and to replace the outdated, high maintenance water treatment facility. The former WTP has no computerized control or SCADA system, and operating the process equipment, water intake, and distribution systems required a great deal of time. Spanish is the native language for most of the plant personnel, and several of them were not fluent in technical English.

ICONICS Software Deployed

ICONICS GENESIS32™ suite of OPC Web-enabled HMI and SCADA applications was selected by the CH2M HILL SCADA project team and Webb County Engineers due to its language switching capabilities. During the design development time, it was the only major HMI package that included this feature, providing operators with the ability to interface with the SCADA system in either language, English or Spanish. The developed software serves to gather WTP process data, as well as monitor, alarm, present, and trend the plant information. Webb County and CH2M HILL also selected ICONICS AlarmWorX32™ MMX alarm notification software and WebHMI™ for secure remote access.

Project Summary

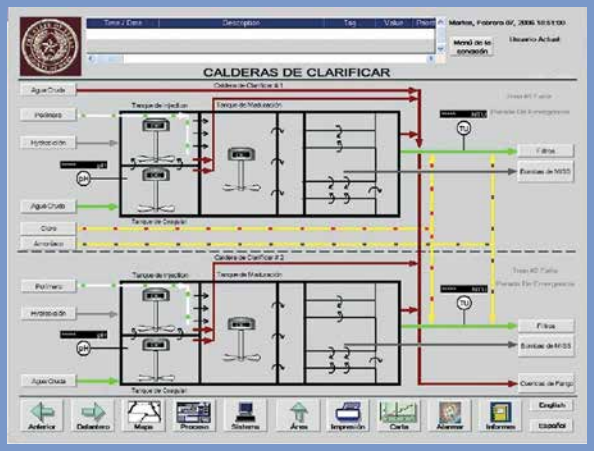
To meet the requirements for stringent water quality, desired water production, and efficient and economical plant operation and maintenance, sophisticated instrumentation and control and SCADA systems were required. However, as the operations and maintenance staff was largely unfamiliar with computerized control systems, the developed SCADA system needed to be based on a user-friendly, graphically enhanced, bilingual (English/Spanish) package. Equipment tags, process descriptions, and other information incorporated in the SCADA system screens needed to be switched between English and Spanish, in the runtime environment, by selecting a single button. This would ease operators' and maintenance personnel's interaction with the WTP systems.

Benefits of the System

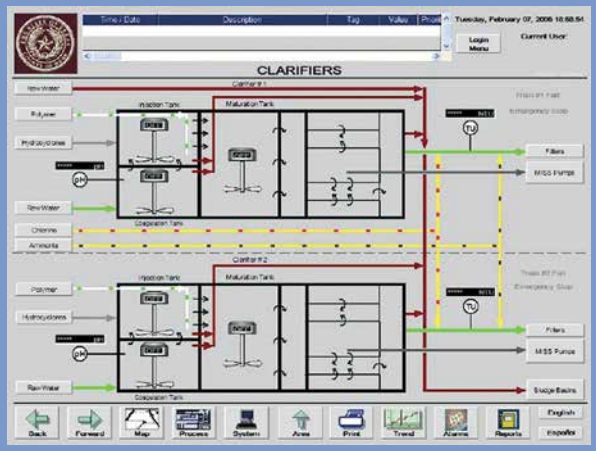
The ICONICS-enabled multi-language support is a convenience to most of the operators, maintenance personnel, and Webb County engineering and management staff that are fluent in both languages. It's a necessity for safe water plant operation for those who might not be confident in using one specific language.

ICONICS GENESIS32 remote alarm notification, real time and historical trending, automated reporting, and secure remote access and monitoring via thin client technology were implemented to allow for ease of monitoring and operation. Webb County worked closely with their engineering partner, CH2M HILL in the Austin, Texas office, to ensure the smooth transition in plant operations. The development of, and adherence to, the HMI software design standards resulted in simple and clear control screens.

Webb County Water Treatment Plant Control System in both English and Spanish, utilizing the GENESIS 32 software, the operators were able to adapt to a computerized control system quickly and easily.



Process Control Screen at Webb County Water in Spanish



The Same Process Control Screen in English

Conclusion

By employing functionality such as reporting systems, remote access to control system data, remote alarm notification, language aliasing, and having the software fully developed and thoroughly tested at the CH2M HILL SCADA lab, Webb County WTP users could quickly see the benefits of the deployed control system. In particular, by implementing the

Case Study Details

While replacing the outdated WTP facility, Webb County Project Engineers sought specific details for the planned HMI/SCADA package including:

- Friendly, intuitive, easy to use HMI/SCADA for WTP personnel and management alike
- Multi-lingual configuration
- Language switching during runtime
- Universal features common to Water/Wastewater industry
- Alarm notification & secure remote Web access

Have your own story to tell?

Has an ICONICS software solution contributed towards your customers' Operational Excellence? We would love to hear about it. We will publish the story (along with your logo) in a future edition of the Success Story Book. Send your story idea in an email to marketing@iconics.com (subject: ICONICS Success Story).

You can also promote your products and services to the world with an advertisement in the next print/online edition of the ICONICS Success Story Book. Full page, half page and quarter page ads help your organization realize its own success. Email marketing@iconics.com (subject: ICONICS Success Story Advertisement).

Customers & Partners Featured

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