

Power & Energy Management, Utilities Customer Success Stories

Proven Solutions for Every Industry





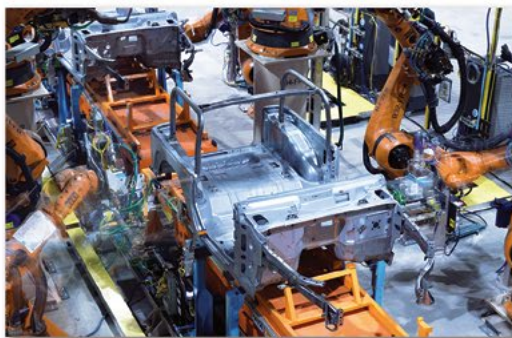
Government
Infrastructure



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 and operational management software for manufacturing intelligence and building automation. ICONICS software delivers significant cost reductions in design, building, deployment and maintenance for a wide variety of manufacturing companies, building owners and government organizations. ICONICS solutions have helped our customers to be profitable, agile and efficient, to improve quality and be more sustainable. Our products are installed in over 300,000 applications worldwide, continuously delivering value to more than 70% of the Fortune 1000.

Microsoft Partner
Gold Application Development

Microsoft Partner
2014 Partner of the Year **Winner**
Public Sector: CityNext


Visualize Your Enterprise™

Table of Contents

Introduction

About ICONICS	i
President's Message	ii
Microsoft CityNext Partner of the Year	iii
Microsoft Sustainability Partner of the Year	iv
Featured Article: Microsoft Campus	v
Featured Article: Washington Athletic Club	vii
ICONICS Software Solutions	xiii
Support & Services	xv

Power & Energy Management, Utilities 1

AES Wind Generation	3
Ameren Callaway Plant	5
ContourGlobal Maritsa East 3	7
Converteam	9
E.ON Trend s.r.o.	11
Environmental Power Corporation (Microgy)	13
Fort Collins Utilities	15
FuelCell Energy, Inc.	17
General Energy Company (RVS)	19
Manx Electricity Authority	23
Mosenergo Heating and Pipeline	25
Ontario Power/Hemi Controls	27
Permskaya Gres	29
SWISSGRID	31



About ICONICS

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



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 promotes an international culture of innovation and excellence in product design, development, support, training, sales and consulting services for end users, system integrators, OEMs and Channel Partners. ICONICS has over 300,000 applications installed in multiple industries worldwide. ICONICS world headquarters is located in Foxborough, Massachusetts, USA, and the company has offices located throughout the U.S., Europe, Asia, and Australia.

ICONICS products are used in energy smart buildings, automotive, oil & gas, renewable energy, utilities, water/wastewater, pharmaceuticals and many other industries. ICONICS' advanced visualization, productivity, and sustainability solutions are built on its flagship products: GENESIS64™ HMI/SCADA, 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.

For over 29 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 and communication from the shop floor to the enterprise. ICONICS products are OPC Foundation certified for OPC and OPC UA. ICONICS has received the BACnet Advanced Workstation 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.

ICONICS is a longtime Microsoft Gold Certified Partner and winner of the Microsoft Public Sector CityNext Partner of the Year award and Sustainability Partner of the Year award. Microsoft recognizes innovations built on the Microsoft platform that help people, organizations, and cities around the world reduce their energy costs and impact on the environment. ICONICS is a preferred partner for Microsoft's CityNext initiative, which strives to improve the lives of millions of people worldwide.



President's Message

Welcome to the 5th edition of the ICONICS Customer Success Story Catalog. Since ICONICS' founding in 1986, and with over 300,000 installations worldwide, our building and industrial automation software solutions have helped customers in numerous industries and applications. From delivering solutions for the world's largest pipeline to managing energy on Microsoft's campus to automating renewable wind parks, ICONICS' solutions scale from the smallest to the largest and most demanding applications worldwide.

Inside the Success Story Catalog

This catalog is a compilation of the most successful implementations, installations and deployments across the globe. We have organized these stories into the following industry categories:

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

In each of the success stories, you'll read about real world customer needs in achieving unique business objectives and the recommended ICONICS solutions for these needs. These stories also include ICONICS channel partners and system integrators involved in each project.

Three-time Microsoft Partner of the Year Award Winner

Multiple awards highlight the close working relationship between Microsoft and ICONICS. ICONICS is the Public Sector CityNext and Sustainability Partner of the Year for demonstrating excellence in innovation and implementation of customer solutions based on Microsoft technology.

We hope that you enjoy these customer success stories and find out how ICONICS has helped solve real world applications. We also hope these testimonials inspire you to learn how ICONICS can help meet your or your clients' automation software needs.

Thank you again to those customers and partners who helped us put this Success Story Catalog together. And to our potential new customers and partners, we look forward to working with you.

Sincerely,



Russell L. Agrusa
President and CEO
ICONICS, Inc.



Russell L. Agrusa
President & CEO
ICONICS, Inc.



CityNext Partner of the Year

"ICONICS is extremely pleased and honored to have won the CityNext Partner of the Year Award from Microsoft," said Russ Agrusa, President and CEO of ICONICS. "This is our third Partner of the Year Award and recognizes innovation and success at providing software solutions that reduce energy

Microsoft Partner

2014 Partner of the Year **Winner**

Public Sector: CityNext

consumption and environmental impact. Our CityNext involvement reinforces the partnership we have with Microsoft, as well as ICONICS' commitment to providing our customers and partners with cutting edge energy and sustainability solutions the world over."

Awards were presented in multiple categories, with winners chosen from a set of more than 2,800 entrants from 117 different countries worldwide. ICONICS was recognized for providing outstanding solutions and services in Microsoft's CityNext initiative.

The Microsoft CityNext Partner of the Year Award recognizes the partner who best exemplifies how their solutions built on Microsoft technology to address the most pressing challenges for cities and help them do "more with less". The Microsoft platform provides a connected foundation for cities to build on, utilizing solutions and apps across core city functional solution areas and scenarios that present opportunities for cities to address challenges, spur economic growth and transform where they work and live.

The Microsoft Partner of the Year Awards recognize Microsoft partners that have developed and delivered exceptional Microsoft-based solutions during the past year. ICONICS looks forward to being an ambassador of the global CityNext initiative as more and more countries catch the vision of developing smart cities that will conserve energy, protect environmental resources, and inspire the rest of the world to follow in their footsteps.

ICONICS is a leading independent software supplier and Microsoft Gold Application Development Partner of award-winning, HMI/SCADA, energy management, building automation, MES and manufacturing intelligence solutions, with over 300,000 installations in over 60 countries worldwide.

ICONICS software is recommended for automating, monitoring and optimizing a customer's most critical assets and processes and has been selected by over 70% of Fortune 500 companies.

This recent award highlights the continued partnership between Microsoft and ICONICS. In 2013, ICONICS was named the Application Development Partner of the Year Finalist. In 2012, ICONICS was recognized as Microsoft's Sustainability Partner of the Year. In 2010, ICONICS was honored as the US Windows Independent Software Vendor (ISV) Partner of the Year.

"Microsoft's success as a company depends on great partners, and ICONICS is a shining example of the kind of innovation our partner ecosystem drives year after year. We are honored to recognize ICONICS as this year's winner of the 2014 Microsoft CityNext Partner of the Year award, and we applaud ICONICS' dedication to providing innovative solutions that drive results for our mutual customers."

Phil Sorgen

Vice President, Worldwide Partner Group

Microsoft



Sustainability Partner of the Year

ICONICS was chosen for the Microsoft Sustainability Partner of the Year Award for 2012 from nearly 3,000 entrants. Due to our successful implementation of customer solutions based on Microsoft technology and a continued dedication to new technology, ICONICS puts sustainability at the forefront of our innovation. After the second Microsoft Award received in four years; the other being the 2008 Microsoft Partner of the Year Award; ICONICS is proud to produce the cutting edge software that Microsoft has come to expect and appreciate in ICONICS.

Microsoft
Partner Network™



2012 PARTNER OF THE YEAR
Sustainability
Winner

Sustainability is a growing priority for many businesses including many building and manufacturing facilities worldwide. In the United States alone, industry experts estimate that businesses spend about \$100 billion on energy for their offices. This creates a pronounced need for the careful allocation and management of natural resources. Customers, as a direct result of using the ICONICS solution, have realized a 6-12% cost reduction and energy savings in year one, with an ROI in as short as nine months. A prescriptive software approach to identifying sources of energy loss has proven itself in buildings, manufacturing operations and water/sewer industries.

“For its commitment to helping customers increase the energy-efficiency of their operations, ICONICS, Inc. is recognized by Microsoft as the 2012 Sustainability Partner of the Year. By using the Microsoft technology platform to harness the power of real-time data from manufacturing and facility operations, ICONICS has achieved outstanding results in driving customer sustainability efforts and reducing energy costs across all the multiple industries.”

Rob Bernard
Chief Environmental and Cities Strategist
Microsoft

ICONICS' Sustainability and AnalytiX® solutions help reduce energy costs, cut consumption, and curtail carbon-based greenhouse gases generated by manufacturers, buildings and factories. To achieve these goals, ICONICS solutions utilize the complete Microsoft stack including; .NET (WPF, WCF, WF), Silverlight, Active Directory, Windows Server, Windows 8, SharePoint 2010, SQL Server 2012, Internet Explorer, Windows Phone, Bing Maps, IIS and Office 2013.

In today's competitive global economy, everyone is looking for ways to reduce consumption, monitor conditions, lower energy costs and minimize carbon emissions. To that end, ICONICS designed its AnalytiX

suite with the flexibility to cater to any application in any industry. Virtually any process, production or building data that requires summarization, aggregation, comparison and observation over time can greatly benefit from this solution. Applications range from buildings and facilities, smart grids, large water plants, wind and solar renewable energy sites, airports and campus-wide installations; all providing the desired, sustainable results that customers can anticipate when using ICONICS software solutions.



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, en-

abled 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.

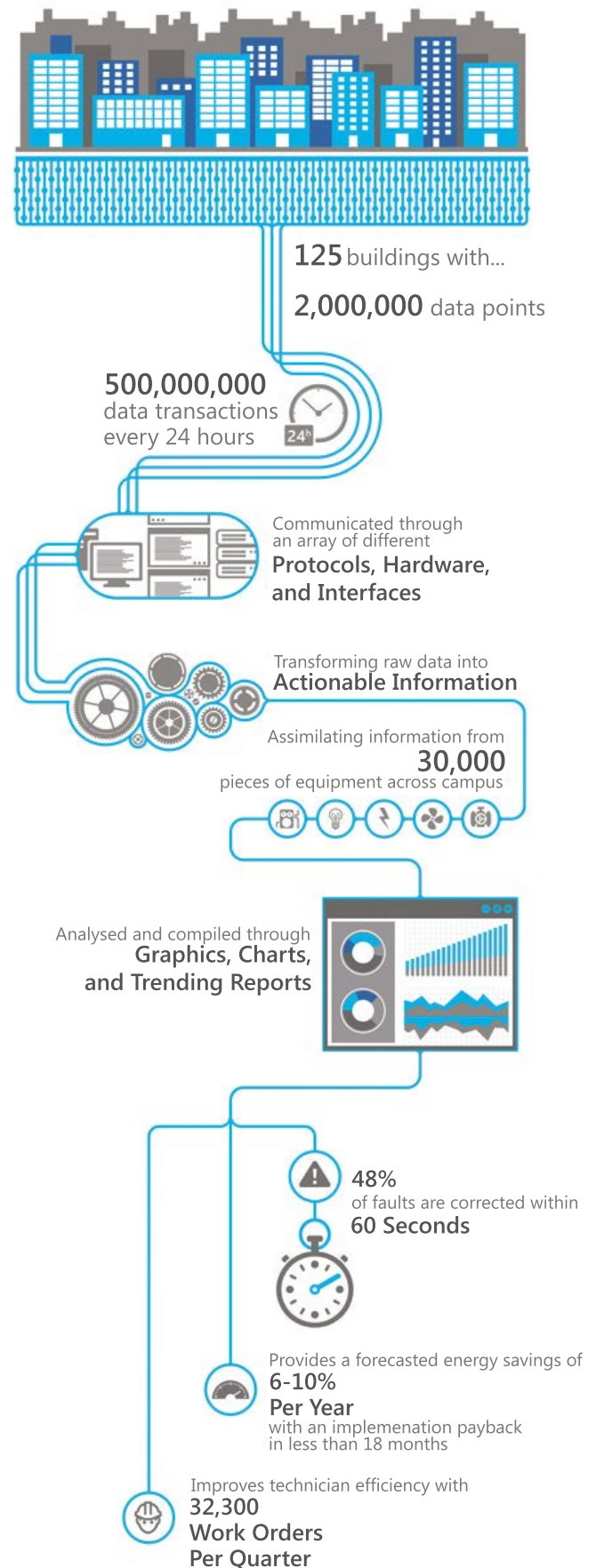
They used to move from building to building, camping out in each for two weeks at a time to inspect and tune it top to bottom before moving on to the next. It would take them five years to tune up all of the buildings on campus, and then they'd start the process all over again. Their tune-ups were making 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.

Microsoft's Smart Campus



Built using Microsoft technology



Key features

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



Out with the old, in with the new

Two years ago, Washington Athletic Club rolled out a cloud-based solution from ICONICS to monitor its energy usage and regulate consumption in real time. The organisation is already saving more than US\$200,000 per year on its energy bills. Rebecca Lambert finds out more

As six-time winner of the 5-Star Platinum Club of America award, Washington Athletic Club (WAC), based in downtown Seattle in the US state of Washington, has a long-standing reputation for being one of the best athletic clubs in the US. More recently, it has also gained recognition for its energy saving efforts and is now considered to be one of Seattle's greenest buildings – no small feat for an 84-year old construction based somewhere that is consistently ranked among the top green cities in the country.

Two years ago, WAC partnered with project contractor MacDonald-Miller Facility Solutions in a bid to optimise energy performance and reduce its carbon footprint. The ambitious project involved overhauling all of the building's legacy energy systems and replacing them with one digital system from ICONICS that monitors usage and regulates consumption based on real-time needs. Following the project's completion, first year energy savings were in the region of

US\$200,000 – 10% above target, amounting to a 25% reduction in total energy use. This year, the building expects to save even more.

"Since it was built in 1930, WAC has been committed to making continuous upgrades to its facilities to meet the needs of its more than 12,000 members and retain its prestigious reputation as one of the nation's top athletic clubs," says Paul Lowber, WAC's chief financial officer. "One of our ongoing challenges has been how to keep the building contemporary and ensure it runs as efficiently as possible. We've always tried to be good stewards; we were into conservation before conservation was cool! But this latest project has really taken our green credentials to another level."

Financial sense

At 21 stories high, the club is home to 109 hotel rooms; five floors of fitness amenities, including a full-size basketball court and swimming pool; banquet and conference rooms; retail outlets; and more. Any project

covering this kind of scale was always going to be a massive undertaking, and a costly one.

"The building has been expanded twice since it was constructed," says Bill Cohen, the club's vice president of operations. "In 1955 we added a four-story extension and then in the 1970s we built a further eight floors on top of that. The result was that we had three distinct areas of infrastructure and, therefore, three different philosophies for managing the building's heating, ventilation and air conditioning. To put it kindly, we had a real hybrid energy system to deal with. None of the subsystems talked to each other very well and we had two separate areas of digital control that really didn't like each other. So while we knew we could make improvements, we also knew it was going to be very costly, and this held us back."

In fact, when MacDonald-Miller Facility Solutions came up with a proposal that showed WAC just how much money they could save, and how quickly they could realise

Recognising success

ICONICS has recently been announced the winner of the 2014 Microsoft CityNext Partner of the Year award. Chosen for its ability to help customers, including WAC, realise tangible benefits from solutions such as the MobileHMI App, ICONICS exemplifies how partners can take advantage of Microsoft technology to address the most pressing challenges for cities and help them do more with less.

"ICONICS is extremely honoured to have been selected for this prestigious global award from Microsoft," says Russ Agrusa, president and CEO of ICONICS. "This award recognises innovation and success at providing software solutions that help customers reduce consumption and environmental impact. Our CityNext involvement reinforces the strength of our relationship with Microsoft, as well as our commitment to providing our customers and partners with cutting-edge energy and sustainability solutions the world over."



those savings by implementing ICONICS' new building control system, it sounded almost too good to be true – so much so that the project was shelved for a year.

"The statistics were compelling, but we were just going through the recession so we were selective about the projects we were going to start," admits Lowber. "Then some funding came through and MacDonald-Miller agreed to offset the rest of the costs of the project via actual energy savings over the next seven years. This meant we wouldn't be out of pocket and that really got our attention!"

Alongside MacDonald-Miller's payment scheme, funding from a US Department of Energy grant and Seattle City Light incentives helped pay for the project upfront. Both of these initiatives are related to Seattle 2030 District – an interdisciplinary public-private collaborative working to create a groundbreaking high-performance building district in downtown Seattle that will consume 50% less energy by 2030.

"We decided to just go for it," says Lowber. "Now, we're wrapping up year two and it looks like we're going to be saving well over US\$200,000 again."

"It would probably have taken us ten years to complete this project and get to the stage we're at now if we'd tried to do this by ourselves," adds Mike Young, WAC's building operations manager. "It's been nothing but a win-win situation."

Smooth transition

The project involved replacing and integrating WAC's legacy control systems with a new building automation system from ICONICS, converting a three-way, constant-volume chilled water system to a load-based, variable-volume system, and replacing pneumatic actuation with electric, load-based kitchen ventilation controls. Today, the entire building's heating, ventilation and air conditioning are controlled by one digital system that monitors usage based on real-time needs.

"Working hand-in-hand with MacDonald-Miller, we pretty much tore the building apart and put it back together in about a year and a half," says Cohen. "We did a lot of the work upfront – we strung the wires, mounted the hardware and installed a lot of the equipment – and then went back and started changing everything over a piece at a time. This approach allowed us to change to the new system relatively seamlessly – we never had to turn anything off, so people in the building weren't even aware of what was happening. We just switched the controls from old analogue to new digital – at times we even did it in the middle of the day and nobody noticed."

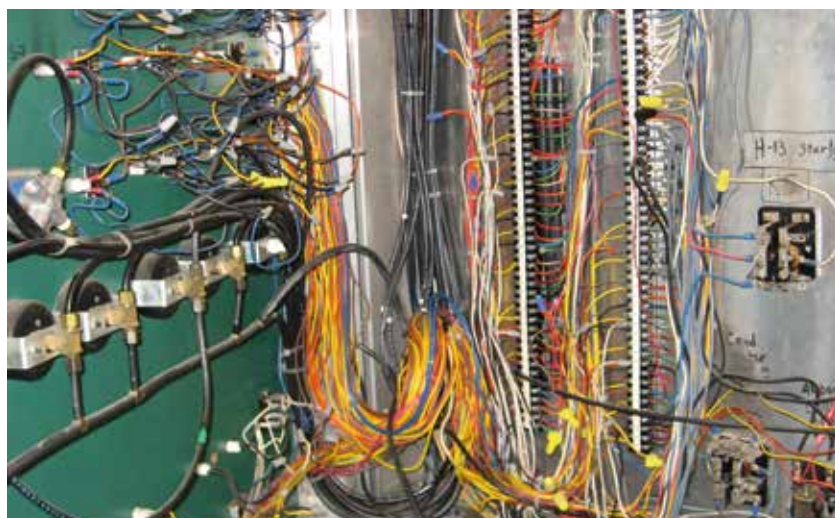
Managing from the cloud

The MobileHMI App developed by ICONICS is a cloud-based business and visual intelligence solution, and is now being used by the WAC team to monitor energy usage throughout the building. Connected to the



Honeywell AX Building Management System via BACnet/IP, the solution provides real-time access to key operational performance indicators through energy performance dashboards and analytics reports. This allows Young and his team of engineers and technicians to remain informed at any time.

MacDonald-Miller considered different ways of deploying the software at WAC before choosing MobileHMI. “One option was to install an on-premise solution,” explains Jeremy Richmond, building performance manager at MacDonald-Miller. “But we realised that this would create a lag getting technology upgrades, and cause issues if we wanted to get data offsite to assist with trouble shooting. When ICONICS first started talking about running a solution on the Microsoft Azure cloud computing platform, we were very interested in it. Today, we are extremely pleased with the results of implementing ICONICS on Microsoft Azure.”



WAC's old analogue energy control system (top) was replaced by modern network-based digital controls (bottom)

Running on a single computer at WAC, the MobileHMI App aggregates all of the building's data in the cloud and pushes it back down to the computers and devices at WAC and MacDonald-Miller, allowing both teams to analyse real-time information.

“The ICONICS software is a really valuable tool,” says Richmond. “Because it's hosted in the cloud, it can be accessed from a range of mobile devices, plus it's robust and scalable. In this particular deployment, it's handling over 2,000 data points, but it can deal with even more if need be. It also takes some of the guessing out of the equation, in that it allows you to see where the problems may or may not be in a facility.”

And because MacDonald-Miller has access to the same information as the club, in some instances it picks up on issues before WAC does. “Working together, we can diagnose problems much faster,” says Richmond.

Tangible benefits

From one dashboard, the WAC team can track and control every aspect of the building and monitor over 2,000 data points in real time. What's more is that if they find a problem, they can look back at the history of a particular set of data points and see where the change occurred. “It's an invaluable trouble-shooting tool,” says Cohen. “It's light-years from the way we used to do things.”

Cover story Smart buildings and infrastructures

The ICONICS MobileHMI App is also helping to dramatically reduce energy consumption throughout the building. “It’s staggering how much less energy we’re using by having the ability to turn things down or off and only use them when the environment calls for it,” says Young. “We’ve experienced real success in our group exercise spaces, for example. On any given day, our exercise spaces can be used for a whole range of activities including yoga, Pilates and aerobics. Some of those classes like a nice cool room, especially the spinning group, but the yoga class likes a warm environment. With the new system, we have the ability to drive the temperatures up and down at will. And we can schedule those changes with very little time between classes. It’s really handy and, most importantly, it takes the controls off the wall.”

The team is achieving similar results in the kitchen area. “We used to turn all the extractor fans on as soon as we fired up the kitchen at 6am,” says Lowber. “Those fans would run all day until we closed at 10pm. Now, with the sensors and a system that measures the air quality in the room, the fans come on automatically when they’re needed. It’s a much smarter system and it allows us to use a third of the energy than we did before.”

A true partnership

Key to the project’s success has been WAC’s partnership with MacDonald-Miller. “They were fundamental to the success of this project,” says Lowber. “They did all of the work and we watched over their shoulders to learn how the system operates. Over the last two years they’ve helped us with the fine-tuning and they continue to ensure we’re using the equipment as effectively as possible. Because they have access to our system, they can provide immediate assistance without having to send out a technician each time.”

Even though WAC is already achieving impressive results, the work doesn’t stop there. “We’re working closely with the WAC team to help them use their data-rich environment to further modify their building practices and become even more energy efficient,” says Perry England, vice president of building performance at MacDonald-Miller. “We’ve achieved impressive savings



WAC is now considered to be one of Seattle's greenest buildings

already, but we can do so much more. Our next step is to get the team accessing the MobileHMI dashboard via mobile devices so that they can always see what’s going on in the building no matter where they are.”

Based on this project’s success, MacDonald-Miller has already rolled the ICONICS system out to other buildings. “Microsoft Azure gives us massive scalability and makes the MobileHMI App an extremely adaptable solution,” says England. “We can take what we’ve done with WAC and apply it to a small building or a large campus – in the most cost-effective way. Regardless of the types and sizes of buildings we are managing, we can provide them with full business analytics. Microsoft Azure has undoubtedly been key to this project’s success. We have been able

to give WAC a business model that has turned their building into a cash machine.”

For anyone still unsure whether to embark on a smart energy saving project, Paul Lowber, Bill Cohen and Mike Young have two words of advice: don’t wait. “Do it now,” says Lowber. “The technology is already out there, so don’t wait for the next big leap. Our financial agreement with MacDonald-Miller has meant that we haven’t had to pay upfront, but the energy savings we’re making so far would have ensured a fast return on investment anyway.”

“And whatever you do, make sure that the system you install is scalable,” adds Young. “We have confidence in our solution and know that it will scale and adapt to our needs. Having access to unlimited computational horsepower is invaluable.”

Allowing full visibility of buildings' equipment

Melissa Topp, director of global marketing at ICONICS, explains how fault detection and diagnostics is influencing a paradigm shift in the way organisations monitor, detect and repair faults within building equipment

Widespread smart city initiatives and government sustainability incentives are putting pressure on public sector organisations to reduce consumption and cut energy costs. Because of this, ICONICS have seen increasing interest in smart buildings solutions that improve monitoring of building automation equipment and energy systems to identify faults and improve efficiency.

A major challenge is getting insight from disparate energy systems and building automation equipment that span organisations' campuses or facilities. Facility managers lack a single view of their facility and, without the ability to correlate the data, they're unable to recognise patterns that equate to the loss of millions of dollars in energy costs.

Some organisations are cautious of smart building solutions because of a preconception that they will have to rip and replace all the equipment in their buildings. But that's not the case with ICONICS' Facility AnalytiX. Because it is an open integration platform, any building automation equipment or device can be integrated into the solution.

ICONICS' Facility AnalytiX is driving a paradigm shift away from retro-commissioning to continuous commissioning. Historically, facility managers of large campuses such as universities, government organisations, hospitals or airports will follow a maintenance schedule and work their way through each building to monitor every piece of equipment and system. In some cases, they may only get to some buildings once every five years. And after reviewing and repairing the faults, the equipment starts to degrade again as soon as they leave the building. In contrast, Facility AnalytiX allows users to have full visibility of their entire facility and continuously casts a net for faults. The solution then allows them to dig further into the fault information and make informed decisions about where to spend resources based on costs and priorities.

Based on fault detection and diagnostics (FDD) technology, Facility AnalytiX has three main features: customisable rules for detecting faults; dynamic cost calculations to help prioritise faults; and visualisation to diagnose and repair faults.

Facility AnalytiX comes with more than 300 tested and preconfigured fault rules for common building automation equipment, while advanced diagnostics suggest probable causes for faults. Historic trends are also provided so users can view how many times the fault has occurred over recent weeks, months or even years to determine a recurring problem. All of this is visualised as easy-to-consume text, graphs or charts. For improved mobility, users can deploy the solution on a cloud connector and access the data from anywhere at any time,

meaning a facility manager can monitor the status of equipment across multiple buildings and campuses while working in another facility.

Once public sector organisations are successful with monitoring and repairing faults, they are then able to involve citizens in their wider sustainability strategy. For example, students could be given access to data regarding which dormitory is the most energy efficient, to incentivise them and encourage a wider acceptance of the strategy. Likewise, neighbourhoods could compete for the most efficient energy usage or the lowest water consumption. Involving all possible stakeholders in the process is the secret to a truly successful deployment, with Facility AnalytiX as its cornerstone.

“Any building automation equipment or device can be integrated into the solution”

Melissa Topp

ICONICS



Facility AnalytiX's dashboard provides easy access to information

Software Solutions

ICONICS Software Solutions cover a wide variety of customer and partner visualization, control and analysis needs. 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 processes in a wide variety of industries and applications worldwide.

GENESIS64™ is a mission critical, scalable, 64-bit HMI/SCADA and Building Automation solution utilizing the latest visualization technologies. Delivering high-powered, easy to use 2D, 3D and GEO SCADA HMI visualizations with natural user interfaces, it provides universal connectivity through certified OPC, OPC UA, BACnet, SNMP and Web Service protocols.

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.

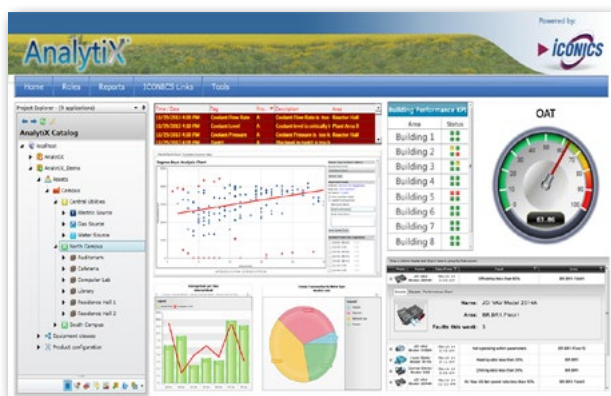


Analytics

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® is a sustainability and energy management solution that helps reduce energy costs, cut consumption and curtail carbon-based greenhouse gases generated by manufacturers, buildings and factories. Energy AnalytiX' ability to integrate data from any electric, gas, fuel, steam or water meter, as well as operations and business variables, delivers the insight needed to identify improvement opportunities.

Facility AnalytiX® is a predictive equipment diagnostic solution that uses an advanced Fault Detection and Diagnostics (FDD) Engine to analyze all available information to detect and predict faults in equipment. Incorporating a library of over 300 standard fault rules, Facility AnalytiX advises management, operators and maintenance personnel of actions to prevent equipment failures or excessive use of energy.



Quality AnalytiX® is a real-time Statistical Process Control (SPC) quality analysis solution, offering an extensive set of SPC calculations, control charts, portal dashboard views and standard quality reports. This information can be visualized in a variety of combinations to help pinpoint quality outliers. It enables operators, quality personnel, manufacturing engineers and management reduce scrap and improve production yields in any application.

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 Web browser or Microsoft SharePoint portal.

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

Software Solutions

Web and Mobile Solutions

With ICONICS' Mobile and Web 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™ 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™ provides real-time mobile access to critical data in manufacturing, industrial and building operations, maximizing the value of corporate data and improving ROI and overall business performance. Deliver dazzling graphics, charts, trends, grids and push alert notifications to any smartphone or tablet. New **KPIWorX™** allows for the creation of self-service dashboards, with responsive design technology to deliver a consistent view on Any Glass™. New **MobileHMI** augmented reality technology visualizes real-time information, streams video and fuses information from multiple sources to location-aware smart mobile devices.



Manufacturing Intelligence

ICONICS' Manufacturing Intelligence 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.

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.

BridgeWorX™ performs efficient data exchange to and from any database or data source. With a unique visual transaction data-mapping configuration wizard, users are able to transfer information, including commands, to and from real-time OPC or BACnet devices, Web services and corporate business information systems.

ReportWorX™ is a powerful reporting tool that turns volumes of data into manufacturing intelligence. Connecting to multiple data sources, including real-time OPC and BACnet data, as well as databases and Web Services, ReportWorX processes data from the plant floor, corporate business systems and everywhere in between.

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™ is a high-performance, mission-critical, industrial data historian designed for the most demanding applications and to log greater than 100,000 tags per second. Hyper Historian works with multiple data sources across the enterprise including OPC UA Servers, BACnet, SNMP, Web services and many more.

Hyper Historian is also one of the first industrial plant historians available on the cloud. ICONICS Cloud Historian leverages Microsoft Azure to visualize Big Data on any desktop, Web browser or mobile device, reducing IT costs with simple setup and minimal maintenance requirements. This allows customers to infinitely grow applications based on changing business needs.

Global Technical Support

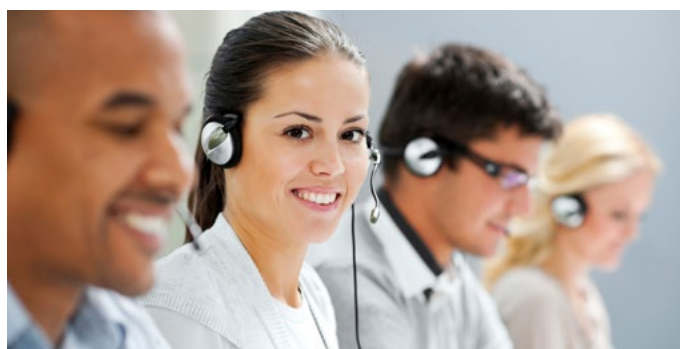
ICONICS has created a service and support structure to assist customers and partners with our software solutions. We continually invest in the latest technologies, linking our support and engineering organizations together electronically. When you call our support line, or access our online support portal, 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
-

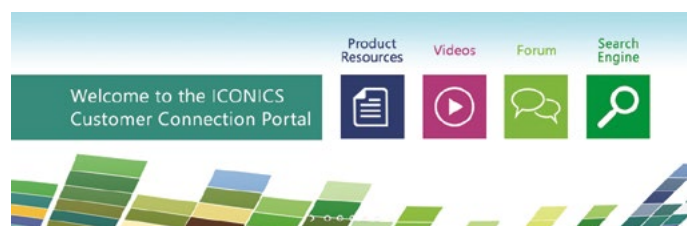


Customer Connection Portal

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. 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. Training is available in our training centers around the world.

Certification is offered to any student who successfully completes an ICONICS provided training course. Training is an essential component of ICONICS' channel certification programs, including its Systems Integrator Program (SIP), Distributor and Representative Certification Programs.

ICONICS Training Features:

- Globally Scheduled Classroom Training
 - Extensive Training Books & Class Materials
 - 2-day and 3-day Classes or 1 Week Packages
 - On-site Training with Customer Specified Content
-

ICONICS is dedicated to providing the highest quality of training. We offer an array of training courses on ICONICS GENESIS64, GENESIS32, Hyper Historian, AnalytiX and BizViz Product Suites. Official ICONICS training is scheduled at ICONICS' global support centers. Custom training courses are available by request and may be conducted at customer locations. For additional information, please contact ICONICS or its sales representatives.

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

Contact ICONICS to schedule customized training to fit your organization's exact needs, either in our facilities, or yours.

Courses are scheduled in ICONICS facilities around the world, where and when you need them.

"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, CA



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.

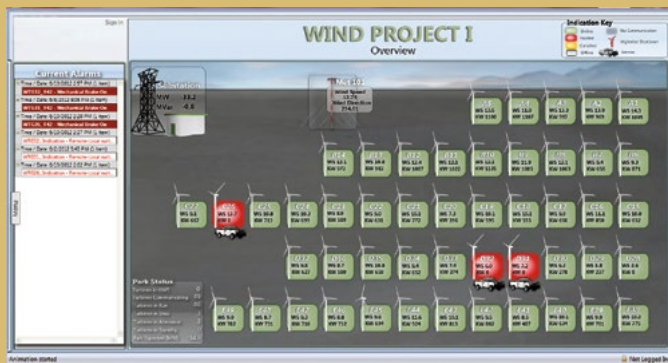
Additionally, the HMI interface needed to be delivered without software installation on the client computers and without authorization issues outside of the portal itself. In other words, AES would not need to share the NT authorization outside of their domain, but control users could still access the 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.

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.

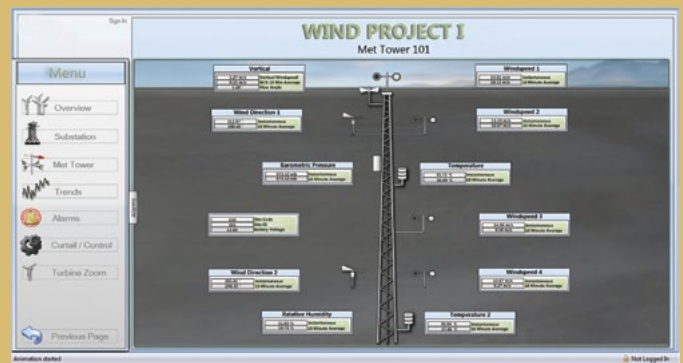
Conclusion

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



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

- 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 Callaway Plant Fulton, MO



*Ameren's Callaway Nuclear Power Plant
Fulton, Missouri*



Plant Control Room at Ameren Callaway Facility

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

"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

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.

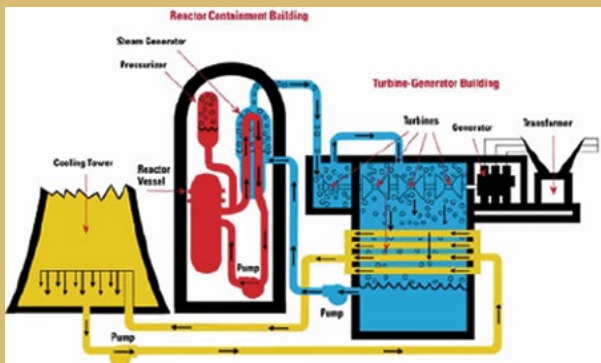
Key Features

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

ICONICS Software Deployed

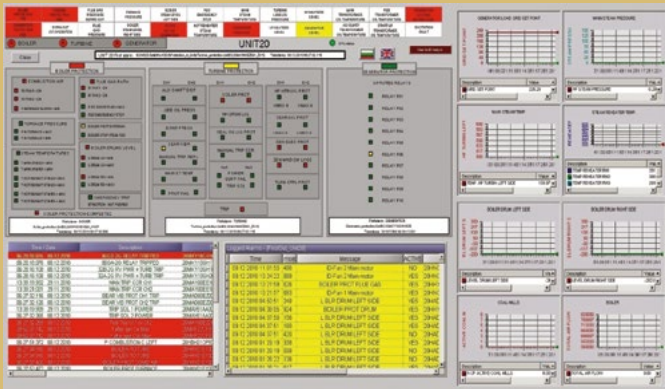
Maritsa East 3 TPP selected ICONICS GENESIS32™ software. EXBIT implemented GraphWorX™32, TrendWorX™32, GenBroker™, DataWorX™32, WebHMI™ for Web-based real-time automation, AlarmWorX™32 Multimedia for real-time and SMS alarm notifications. ReportWorX™ is being used to generate reports. They also chose 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.



UNIT 20 – “First Out” Function Screen

About ContourGlobal Maritsa East 3 Thermal Power Plant / EXBIT Ltd.

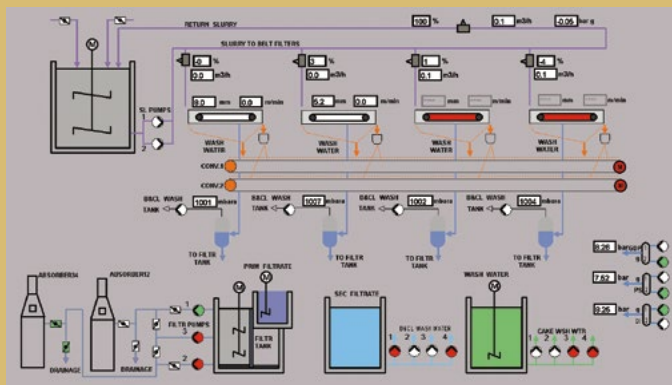
Since 2011 Maritsa East 3 Thermal Power Plant (TPP) has been owned by ContourGlobal. It is the third largest power plant in Bulgaria, generates 30 percent of the country's electricity and is one of four power plants that makeup the Maritsa East Energy Complex. The lignite-fueled plant supplies electricity 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.

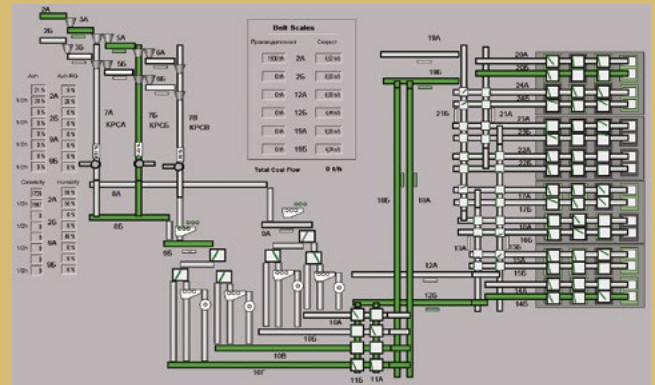
For visualization, EXBIT created graphical screens on which data is shown through dynamic GENESIS32 displays. These displays allow visualization of the main control system, Siemens DCS SPPA-T2000, and all of the plant's sub-systems. Displays, alarms and trends are exhibited on wall-mounted displays in 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 Handling 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.

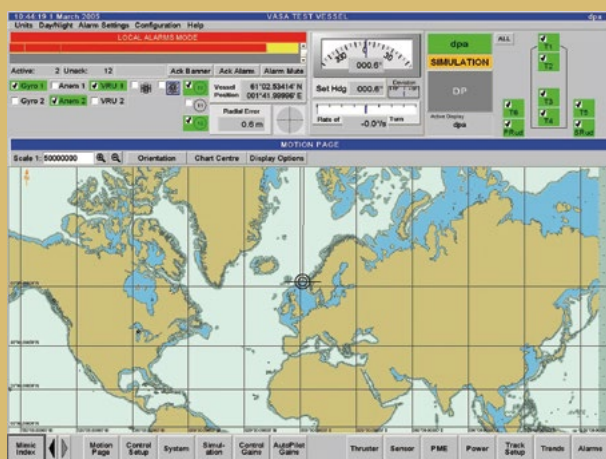


Converteam

Rugby, UK



Part of the LNG Fleet



HMI Day View

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.

"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

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.



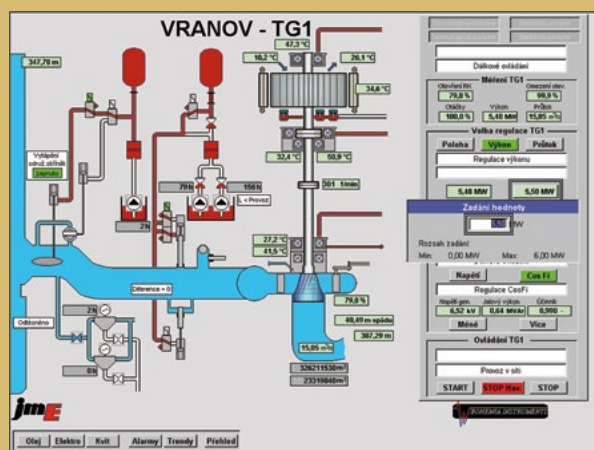
E.ON Trend s.r.o.

České Budějovice, Czech Republic

e-on

invelt
group

Hydro Turbines
E.ON Hydro Power Station



Turbine Monitoring Screen at E.ON

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.

"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.

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

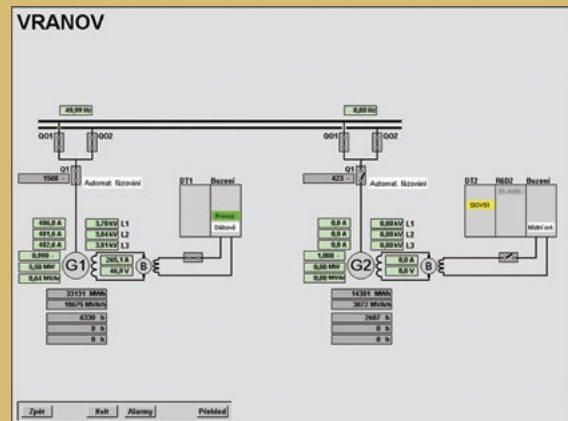
Data is communicated to the central command center via E.ON's optical network. GENESIS32 works as a data acquisition and logger for all turbines. At the core of the system, two GENESIS32 servers work redundantly with DataWorX32. OPC servers are used for gathering the data from SAIA PLCs. GENESIS32 is 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

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.



An E.ON Hydroelectric Power Plant



GraphWorX32 Screen for Planning E.ON's Energy Production

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.

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

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

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 “car-

“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

bon 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

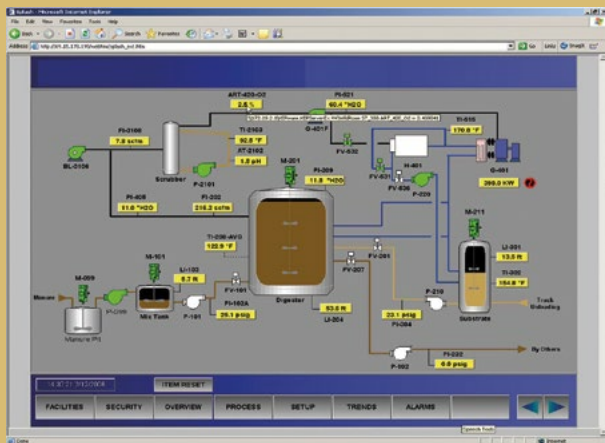
the United States' Western and Midwestern regions: Five Star Dairy and Wild Rose Dairy in Wisconsin, Norswiss Dairy in South Dakota, and Huckabay Ridge in Texas. For Microgy's biggest facility, targeted production is enough RNG to heat over 13,500 homes annually.

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

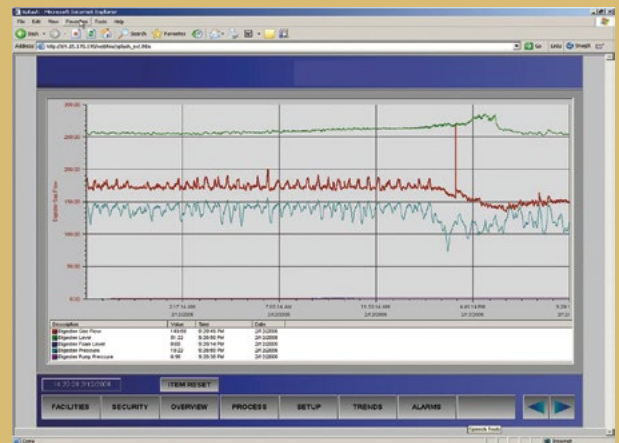
Benefits of the System

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

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.

Conclusion

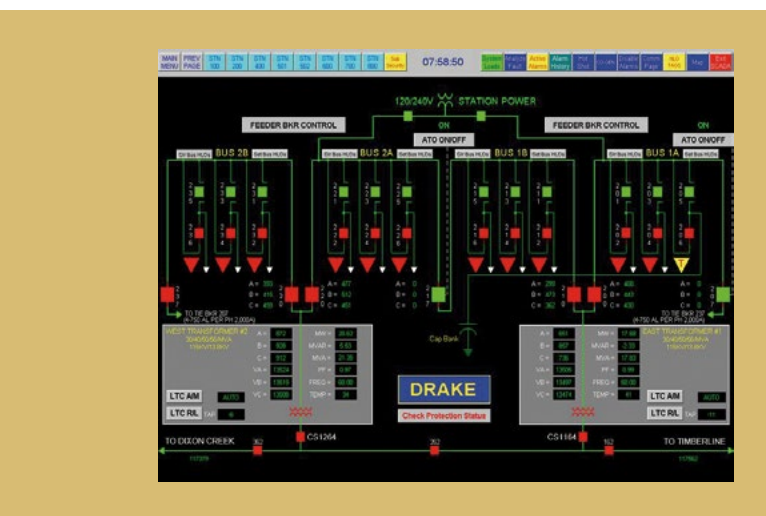
ICONICS and Wunderlich-Malec Engineering have worked to provide Microgy with a complete visualization and automation solution. Enabling Microgy's novel digestion technology assists with animal waste management and generates environmentally responsible energy.



*Fort Collins Utilities
Monitored Substation*

Fort Collins Utilities

Fort Collins, Colorado



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 uninterrupted 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.

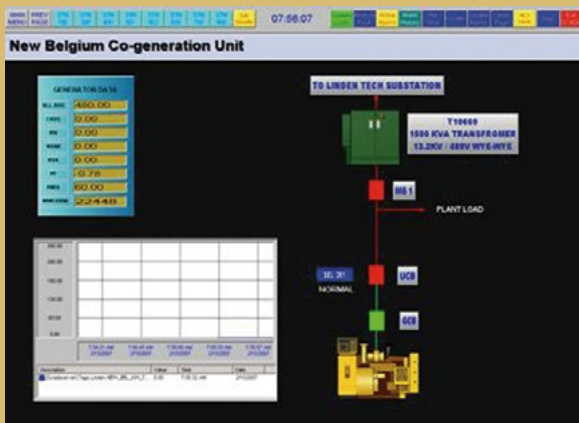
Fort Collins Light & Power required software that they would be able to test before making any purchase decision and that wouldn’t require any proprietary custom software drivers or protocols. They had decided to move to the OPC standard to provide

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.

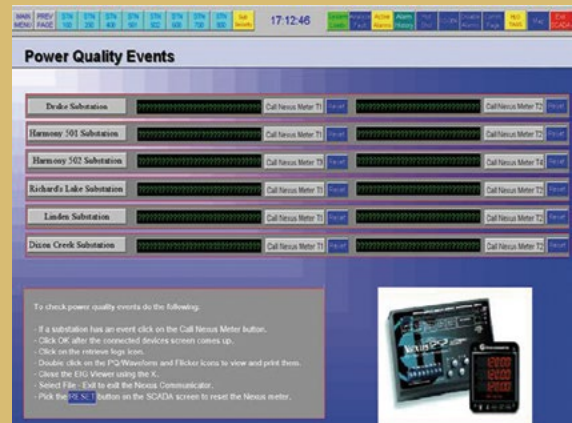
Benefits of the System

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.



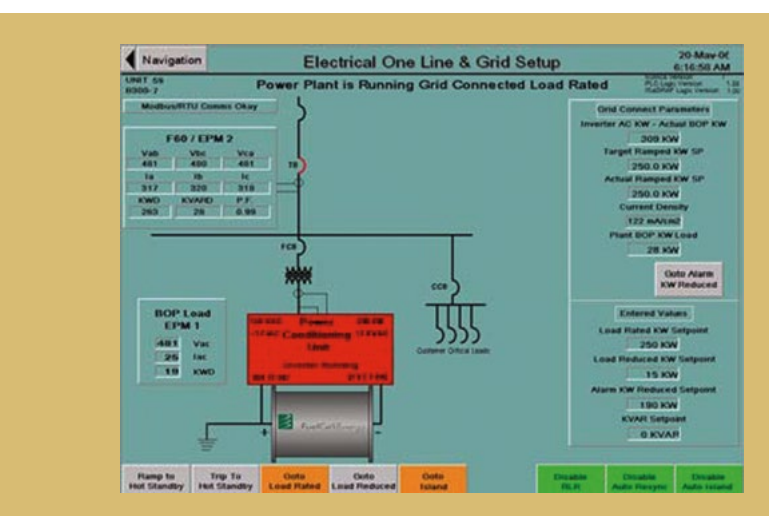
FuelCell Energy, Inc.

Danbury, CT



FuelCell Energy
Ultra-Clean, Efficient, Reliable Power

*FuelCell Energy DFC 300s on a
San Diego, CA Tennis Court*



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:

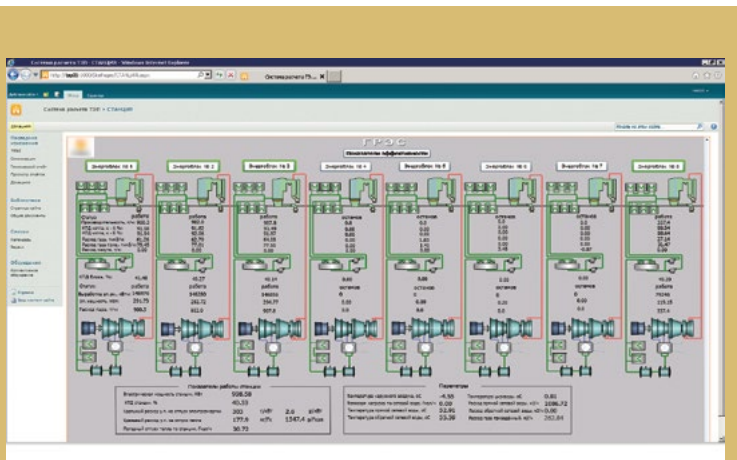
- Secure remote connectivity
- Robust system reliability
- Easy maintenance/troubleshooting
- A rich GUI with advanced features
- OPC-based communications
- Standard VBA scripting



Map of Central Russia

Global Energy Generation Firm Central Russia

GEGF



Overview HMI Screen

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

"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."

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.

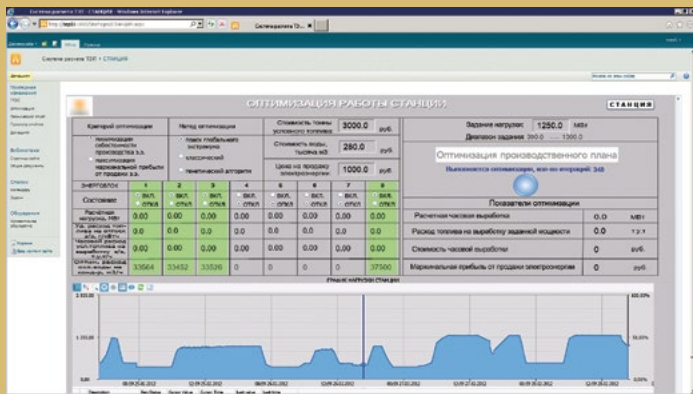
Benefits of the System

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

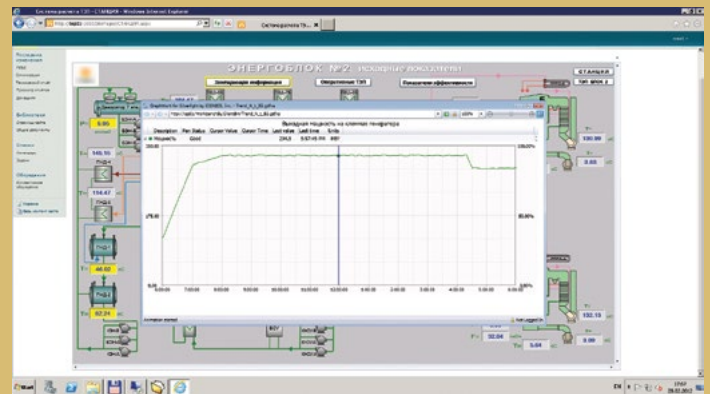
as plant revenue and profit reports.

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



Main Dashboard



Trending Screen

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

- 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

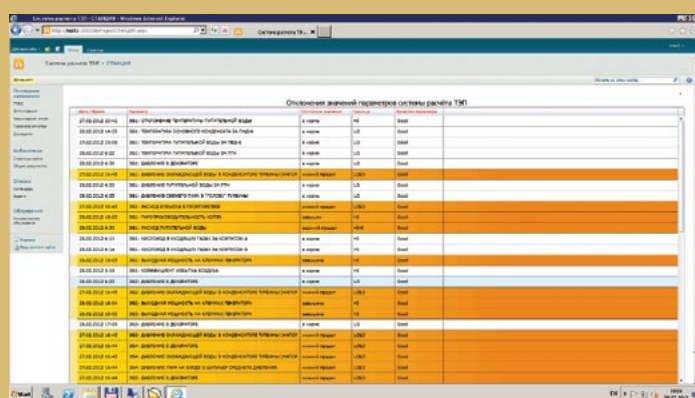
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- Achieved and Forecasted Next Day, Week and Month plant revenue and profit margin based on all cost factors and spot and projected electricity prices

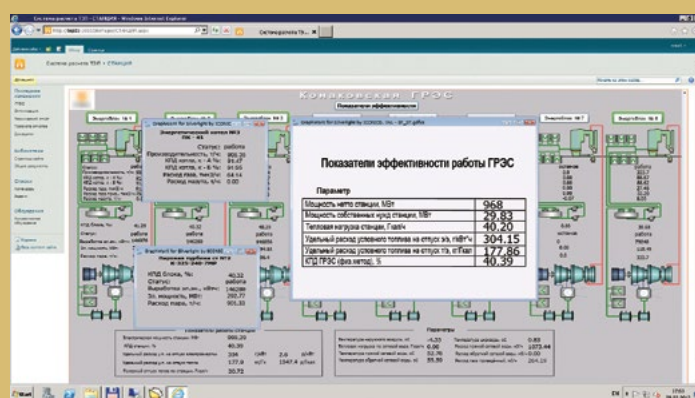
Management at the energy firm notes that the system has increased the ability to better observe processes as well as increased transparency in both operations, and revenue/profit information (both original, estimated and forecasted operational and economic indicators). Operational staff now conduct processes more efficiently due to the introduction of incentive schemes based on

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

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).

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.

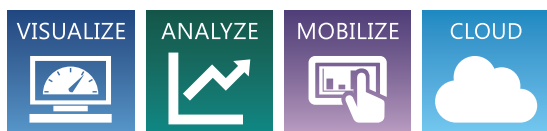
The World's Most Advanced Automation Software



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



www.iconics.com



2008 2012 2014
Microsoft Partner of the Year



Visualize Your Enterprise™

Manx Electricity Authority

Isle of Man, United Kingdom



*The Shores of 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.

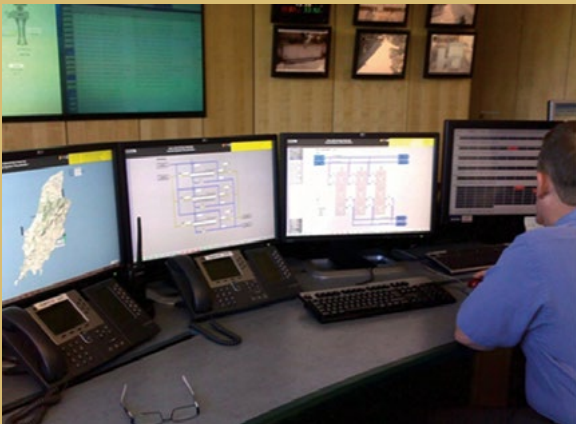
The implementation began by using ICONICS GENESIS32 software to host a pair of redundant servers at each of the key sites. ICONICS software provided a consistent and uniform interface that could be spread across three monitors allowing a single operator, in one control workstation, to manage and control 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,

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



An Operator at the Multi-monitor Control Station



Glen Mooar

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.

- Commissioning and testing completed during the annual plant shutdown week before the Manx TT road races

Conclusion

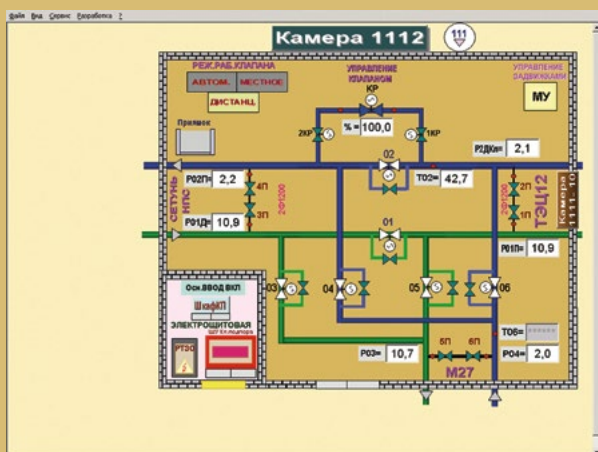
Using ICONICS software, the MEA was able to sync their SCADA applications in such a way that they were able to function under one system and remotely monitor facilities while still being in touch with real-time data and alarms. The success of this project is highlighted by Mike Newby, who said "We have 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.

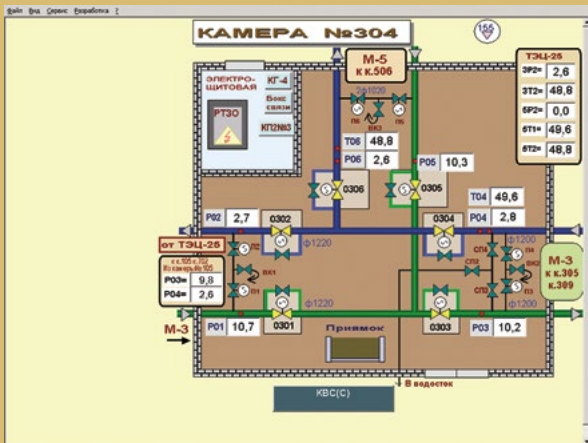
Benefits of the System

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.

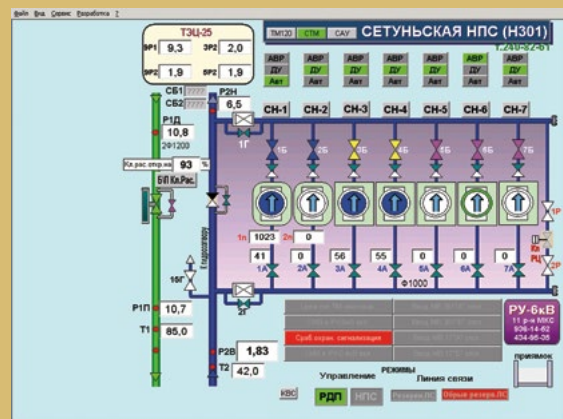
Case Study Details

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

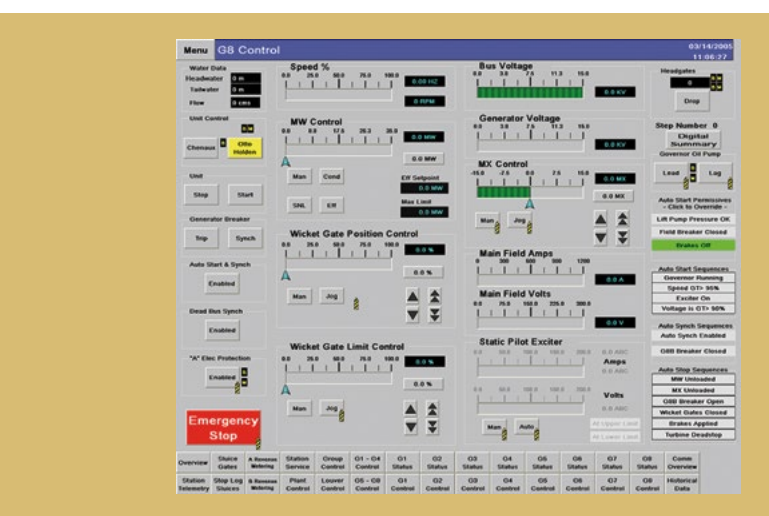
Rapid Development OPC toolkit



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-

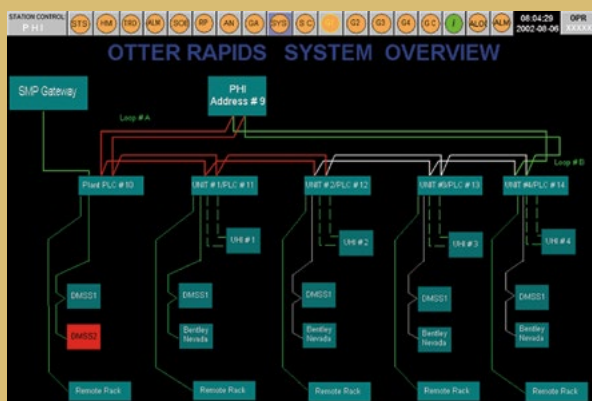
tions and generator simulation software, which are used for detailed testing and system acceptance.

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

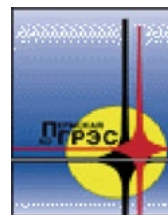
Multimedia OPC Alarm Management Software

ScriptWorX

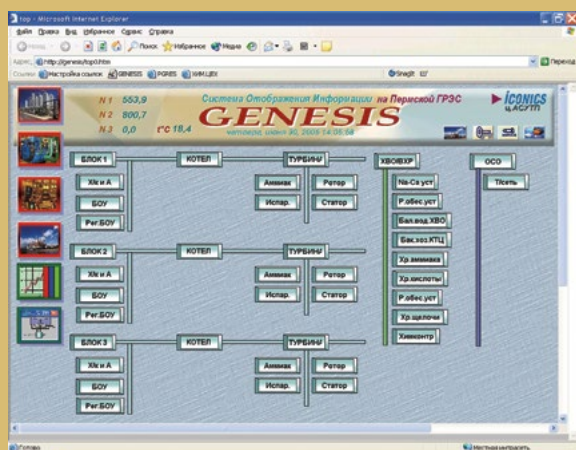
Creation and Management of VBA Scripts for Applications



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™ from 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

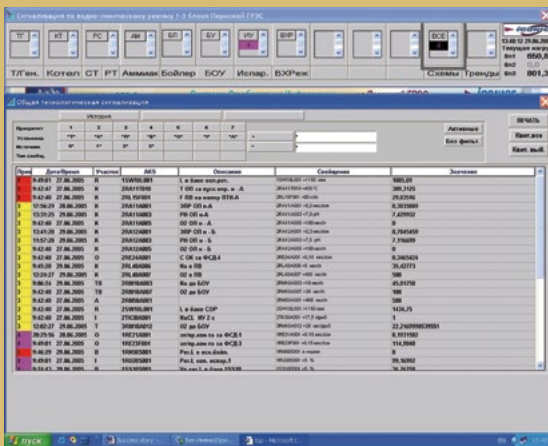
and Windows XP and storing information data to INFORMIX and Microsoft SQL Server.

The OPC server used is called UNIOPC from Fastwell. There are several different information systems where 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.

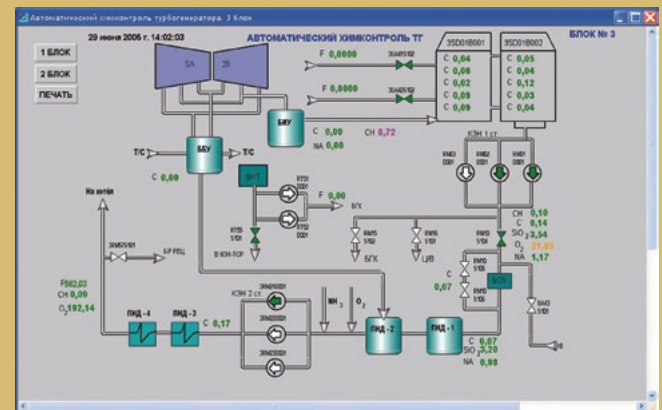
- Whole new level of visualization to real-time information
- Secure, real-time data to remote users
- Prevention of equipment failure with data analysis
- Forecast planning for capacity usage

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



*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.

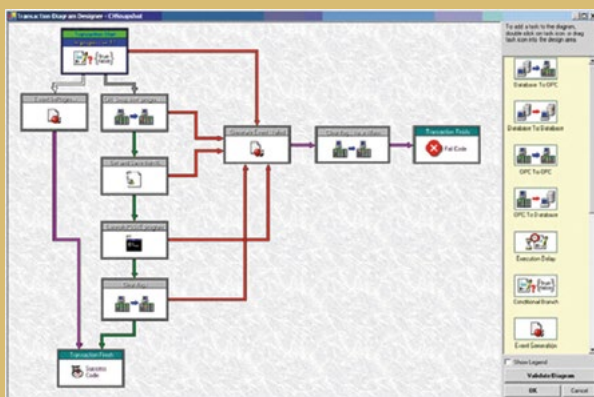
Key Features

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

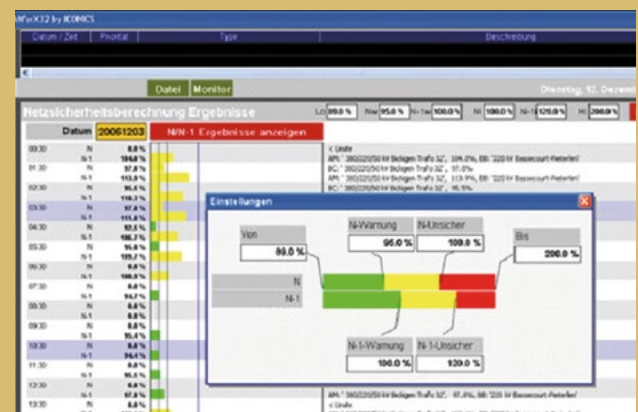
control) within processes that must run 24 hours a day, 7 days a week, 365 days a year and that must be monitored continuously. ICONICS also seamlessly integrates with Swiss Grid's network of power application systems, as well as with different national and international trading and scheduling systems.

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

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

Solutions Highlighted

BizViz

Manufacturing Intelligence and Business Visualization Suite

BridgeWorX

Real-time Workflow Software for Data Bridging

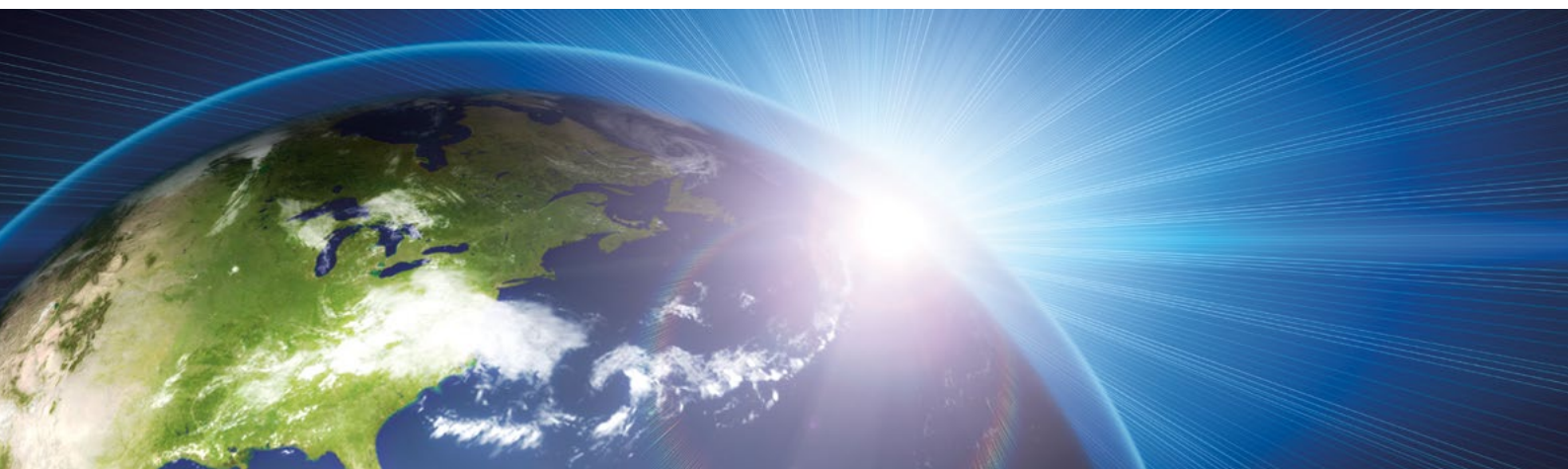
WebHMI

Web-Based Real-Time Automation Software

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 info@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 info@iconics.com (subject: ICONICS Success Story Advertisement).



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