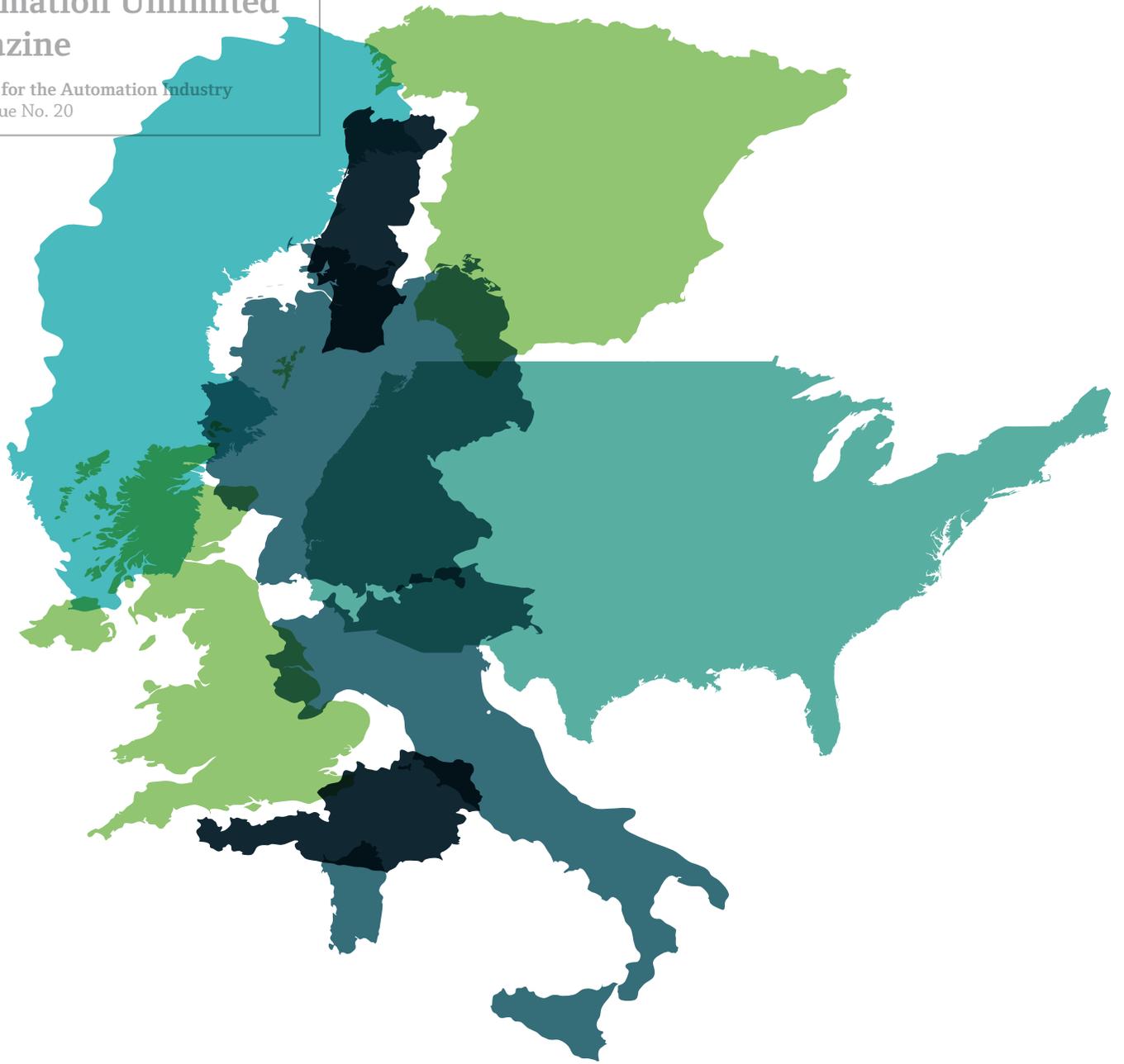




# Information Unlimited Magazine

Magazine for the Automation Industry  
2011 · Issue No. 20











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## IMPRINT

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## A DESIRE FOR MORE

A few years ago, I would travel from customer to customer presenting the new versions of zenon. As I proudly demonstrated the new functions and options, I was sometimes a little affronted as, almost immediately, like a shot ringing from a gun, customers would ask: “But can I also use it for ...?”

Maybe I was partially aggrieved due to developer’s pride. Ultimately, however, the many ideas and suggestions from our customers became a significant part of what makes zenon what it is today. We have always repeatedly managed to inspire a “desire for more” from our customers. This has naturally also fueled our advancement with new, innovative ideas. I see no end to this mutual inspiration. This is because with each new product and each new version there are always thousands of ideas about what we can improve.

This year is full of projects and new products – be it the new website, a new version of zenon, or the zenon Analyzer. All of this invokes, for me in any case, a desire for more.

With this in mind, I’d like to wish you much enjoyment while reading this edition of our *Information Unlimited Magazine* and a pleasant, relaxing summer!



Thomas Punzenberger, CEO

## CONTRIBUTORS

*BERND WIMMER*

shows how helpful the zenon Alarm Management and the Industrial Performance Analyzer are when optimizing productivity.

*MARKUS HELBOK*

introduces the new “Technology Services” team and explains how you benefit from them.

*EMILIAN AXINIA*

describes how zenon supports the calculation and display of real-time online KPIs, thus supporting Food & Beverage manufacturers.

*ALEXANDER RESINGER*

arouses your desire to program with an interesting VSTA example and explains how you can improve the performance of zenon Runtime with it.

*PHILLIP WERR*

describes what Open Innovation means for COPA-DATA and how it is linked to our zenon Analyzer Community.

*GIUSEPPE MENIN*

visited the Smart Grid International Forum in Rome for you and explains the role that software specialists perform when implementing Smart Grids.

Estefanía García Álvarez,  
Susanne Bernhardt, Urszula Bizon-Zaba,  
Sebastian Brugger, Gernot Bugram,  
Bruno Ganner, Susanne Garhammer,  
Bernhard Korten, Kathleen Kuhn,  
Giuseppe Menin, Jakob Miazga, Louis Paglaicetti,  
Ursula Piela, Steve Poynter, Alexander Resinger,  
Mirjam Riesemann, Esther Rutter,  
Bernhard Schuiki, Gerhard Sumereder,  
Noemi Torcasio, Daniela Treiblmaier,  
Stefanie Wagner, Markus Wintersteller

THANK YOU

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# HIGHLIGHTS



*ROBERT HARRISON*  
introduces us to the strictly regulated world of the Pharmaceutical Industry and reveals, in a four-part special, how zenon feels at home there.

*GÜNTHER HASLAUER*  
describes, in the third part of his series titled “.NET Windows Form Controls in zenon”, how you include .NET controls in zenon without having the source code available.

*REINHARD MAYR*  
provides an outlook for the plethora of new and improved features in the next software release, zenon 7.

*JÜRGEN RESCH*  
explains what a Smart Grid can achieve in the medium and low voltage sector.

“Less is more” is often used when referring to something in a generalized manner. Is it true? It probably is if we are talking about material possessions, or inessential decoration. However, it is not true if we are discussing projects that are enjoyable. Work is part of our life. It should provide us with more energy than it costs. For us, this is an important consideration when deciding to undertake new projects, employ new people, put out feelers to the world and make ourselves at home in Scandinavia, Eastern Europe, Asia and in America. “A desire for more” fuels our energy. With COPA-DATA and zenon continuing to develop at a rapid pace, 2011 is a year for us to particularly focus on international teamwork to become even more successful in the many upcoming projects.

#### **IN TRAINING: ZENON 7**

At the moment, a major part of our energy is spent on the new zenon Version 7. Without giving away too much at this point, this version of zenon again sets standards in functionality and ease of use. We continue to work towards simplicity and zenon will become more communicative and even better integrated. Our objective is for you to enjoy configuring projects and to promote fulfillment from successful projects. To this end, we have also come up with new methods to combine the many ideas customers, product managers and developers have in mind, into an impressive new version. At the same time, we have a completely new feature for our F&B customers in the bag and will also surprise our customers in the Pharmaceutical Industry soon. We can't reveal any more about zenon 7 yet. However, we can discuss ...

#### **IN POLE POSITION: ZENON ANALYZER**

We repeatedly found that people involved in automation were missing a comprehensive tool that they can use to evaluate data in real time. A tool that links to any desired source and also creates reports at the time the request is made. This is a great challenge for the many different players operating in the market of data sources today. Our developers worked

flat out on this project. Therefore, at the same time that this magazine is being distributed, the first test version of the new zenon Analyzer is already being used by selected customers. Version 1.1 is performing just as we'd hoped. It is now a matter of optimization, so that Version 2.0 also performs as expected. Soon, the zenon Analyzer will evaluate your data in a clear manner. You can participate as well in shaping the future of it. Take a look at [www.copadata.com/get-involved](http://www.copadata.com/get-involved) and incorporate your ideas as part of the Open Innovation Community for the zenon Analyzer!

#### **LAUNCHED: THE NEW INDUSTRY**

##### **FOCUS - PHARMACEUTICAL**

Pharmaceutical companies have already been familiar with zenon for many years. They value its strengths and its simple FDA-compliant implementation. We are matching this appreciation with commitment. *Pharmaceutical* is becoming a core sector for us. It began promisingly and the reaction from our partners has been encouraging. It has taken off to a running start!

#### **REVISED: COPA-DATA WEBSITE**

We like fresh, contemporary technology. We believe it's important in our communication too. This means that our website needed a little spa-style rejuvenation. We took the time to redesign it with much attention to detail, reduced the navigation levels, made sure the information is clear, and have put it online for you now. We are naturally excited to see how you like it and to gain feedback on how informative it is for you. Discover COPA-DATA online and share your logbook entries with us at: [www.copadata.com](http://www.copadata.com).

#### **GAINED: NEW EMPLOYEES**

A desire for more also means more ventures undertaken together. Our projects and tasks are growing in size. We have new products and with

# WHAT MOVES US ... A DESIRE FOR MORE!

WHAT MOVES YOU? WHAT MOTIVATES YOU TO COMMIT YOURSELF EVERY DAY? WHAT MAKES YOU WANT MORE? THESE ARE IMPORTANT QUESTIONS FOR US. PEOPLE AND PROJECTS THAT EXCITE US SO MUCH THAT WE WANT MORE OF THEM ARE THE INGREDIENTS OF OUR ELIXIR. AFTER ALL, TIME SPENT WORKING IS TIME SPENT LIVING.

them diverse contacts. And who is supposed to handle all of this? If we are to continue to enjoy work and time spent working is to be quality time, then it shouldn't be prolonged endlessly – it must be delegated to the appropriate people. Even in the so-called crisis years, we hired more people, established new teams, such as Technology Services, and ensured continuous growth. Inviting new people to work with us and to continue to develop with us is always a process of sharing ideas and infecting people with joy – and being infected. Every new person to our teams brings a fresh perspective and their desire for more with them.

## **SPREADING OUT: COPA-DATA INTERNATIONAL**

Creating rapports with customers in many countries made us want more. We want to continue to meet many different cultures, to understand them and to find ways to move forward and expand together. And we are moving! We have opened new subsidiaries in diverse areas including Poland, Korea and Spain. It is not just a matter of having many sites, but also creating a reliable basis for joint ideas and projects. We value our customers being as close to an adept contact person as possible. Somebody who not only speaks their language, but also understands how they think. Someone who is ready to answer in-depth questions with constructive answers.

## **A DESIRE FOR MORE: WHAT ABOUT YOU?**

What gives you a “desire for more”? Tell us your situation. If we can contribute something to this, we are happy to give it our best shot. Perhaps this edition of the *IU Magazine* gives you an idea or two. Our tip when it comes to matters of a “desire for more”... Stick to Lord Darlington from Oscar Wilde's *Lady Windermere's Fan*'s motto of: “I can resist anything but temptation”.

Enjoy!  
*do it your way*

From the Transformer Substation to the End Consumer

# The Smart Grid in the Medium and Low Voltage Level



*People talk about intelligent energy grids as the “internet of energy” – there is no shortage of catchy phrases when talking about Smart Grids! But what is the truth behind the buzzwords? And what technical challenges will we face? In the previous edition of our Information Unlimited Magazine (No. 19) we gave you an insight into the world of Smart Grids. In this issue, we aim to enlighten you about Smart Grids in the medium and low voltage field; from the substation to the end consumer.*

The **medium and low voltage area** of the energy supply network is also known as the 'distribution grid'. It transports the electrical energy from the substations to industrial areas and households, with a voltage range of 5 kV to 38 kV. The energy is transferred via cable or overhead lines. The lines start at the substations and end at the transformers, which (in Europe) transform the voltage to 400/230 volts, for example. This voltage is then fed directly to the consumers, such as households or commercial buildings. The medium voltage grid is characterized by a high degree of branching, a large number of elements (masts, transformers, switchgear) and features little or no remote monitoring. The amount of remote monitoring varies greatly from region to region.

#### MONITORING THE MEDIUM AND LOW VOLTAGE AREA OF THE GRID

In the medium voltage grid, demand for the improved monitoring of complex systems is increasing, due to current grid developments. The reasons for this are self-evident: to improve the supply quality (less and/or shorter blackouts), to avoid non-technical losses (electricity theft) and to equip the grid for two-way energy flow to accommodate the anticipated growth in energy creation by private households. The expansion of monitoring will mean that an enormous amount of data will be transferred, which must be processed.

To do this, several systems are required:

- ▶ Distribution Management System (DMS)
- ▶ Global Information System (GIS)
- ▶ Outage Management System (OMS)
- ▶ Customer Information System (CIS) and
- ▶ Work Management System (WMS)

Even if we assume that data is available from the grid, the challenge of having all the systems work together still exists. Compatible operation is currently harmonized in Europe using IEC Standard 61968. This standard defines the Common Information Model (CIM). CIM is used to standardize and simplify the exchange of information. The information to be exchanged is written in UML and then changed into XML format. In this way, it should be possible for the data from the medium voltage grid to be received by a SCADA system (such as zenon) and to be distributed to all the systems involved in a suitable form; these systems then prepare the data according to their requirements and exchange it with each other. For example, a protective device establishes that a transformer in a transformer building is defective and reports this defect to the SCADA system. The SCADA system then, in turn, forwards the information to the following systems:

- ▶ DMS – To recalculate the grid in order to detect any overload of neighboring components.
- ▶ GIS – To show where precisely the event took place and which region is affected.
- ▶ OMS – Triggers an alarm that informs the operator of the event.
- ▶ CIS – Provides the information on the utility's website, so that customers can find out for themselves why they have no power or how long it will take to rectify the fault.

- ▶ WMS – Creates for the people who are to replace the transformer a work order with the GIS data stating where the transformer building is located.

There are already regions in which this scenario is reality. However, in many parts of the world it is still not possible to monitor medium voltage networks as well as this.

#### THE ROLE OF SMART METERS IN MONITORING

Further assistance for the monitoring of distribution grids comes directly from the electricity customers, i.e. the households. Intelligent electricity meters, known as smart meters, can measure energy consumption, establish electricity outages and control the feed-in of energy as a result of energy generation, such as photovoltaic energy. As a result, smart meters are in a position to portray complete tariff models in relation to time of day and season in order to calculate both the cost of consumption and the yield from generation. In some countries, such as in Italy, these smart meters have already been implemented throughout the grid, in other countries they have been tested in isolated regions on a trial basis, and in other countries they do not exist at all. However, the trend is generally moving towards smart meters, because both the energy supply companies and, increasingly, the consumers intend to equip themselves for the challenges of the future.

#### SMART GRID COMMUNICATION

Communication is an especially critical aspect for smart meters. A smart meter must be able to reliably and safely communicate with its central control unit. To this end, there are different approaches such as WLAN, UMTS, satellite or PLC (Power Line Communication). There will not be a single suitable solution. A smart meter in distant regions with a poor cable infrastructure will communicate differently in comparison with a smart meter in a metropolis with a very well developed infrastructure. As a result, there will be a mix of different technologies employed. However, the trend is moving towards TCP/IP based communication.

The path towards a fully developed Smart Grid is still a very long one and will probably never be fully realized due to continually changing requirements in relation to climate change, mobility and technology. This makes it all the more important to use technologies which are as 'future-proof' as possible.

#### SMART GRID AND SCADA

It is safe to say that the Smart Grid will generate an immense amount of data which has to be pre-processed and forwarded by other systems, probably via a SCADA system. COPA-DATA is aware of this requirement and will continue to drive innovation in the field of protocol implementation and the handling of large amounts of data.

If you would like to find out more about intelligent electricity grids, zenon as a distributor of communications or zenon Energy Edition, visit our website at [www.copadata.com/energy](http://www.copadata.com/energy) or write to [energy@copadata.com](mailto:energy@copadata.com). ☞ Jürgen Resch

# Smart Grid: Intelligent Grids to Transfer and Distribute Energy

*COPA-DATA Italy took part in the first Smart Grid International Forum in Rome in November 2010. The objective of the event was to present a comprehensive stock-take of what Smart Grids represent today and what they will represent and could achieve in the future – depending on the respective context. National and international supplier associations were represented, with the objective of making the authorities aware of how important it is to undertake significant supportive measures for industrial development in this field, which all forecasters expect to become strategically significant soon.*

## THE CONTRIBUTION OF SOFTWARE SPECIALISTS TO THE IMPLEMENTATION OF SMART GRIDS

Giuseppe Menin, Area Manager at COPA-DATA Italy, clarified the important role that software experts will play in the process of implementing Smart Grids. Modern Smart Grids need to be able to overcome the challenges of the future: improvement in the quality of energy supply, the reduction of power outages and other technical faults and improved administration of decentralized power generation sources. Against this backdrop, communication between different levels and between the people involved will play an important role.

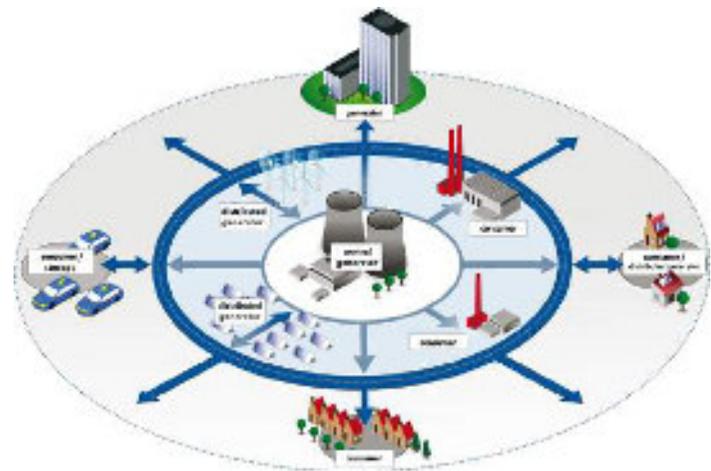
### A TEAM TASK

In order to be able to master these challenges with the new technology, a multi-disciplined approach is required. Electrical engineers, equipment manufacturers, software specialists, system integrators and grid operators need to work as a team in which each company contributes its specialized expertise about the power of Smart Grids.

### INTEROPERABILITY

It is very important that all companies involved in the supply chain 'speak the same language'. The real challenge is, therefore, in the interoperability of the devices and systems of different manufacturers. The advantages are an improved exchange of information, faster reaction times, the freedom to select the most appropriate software and hardware and sharing know-how amongst providers.

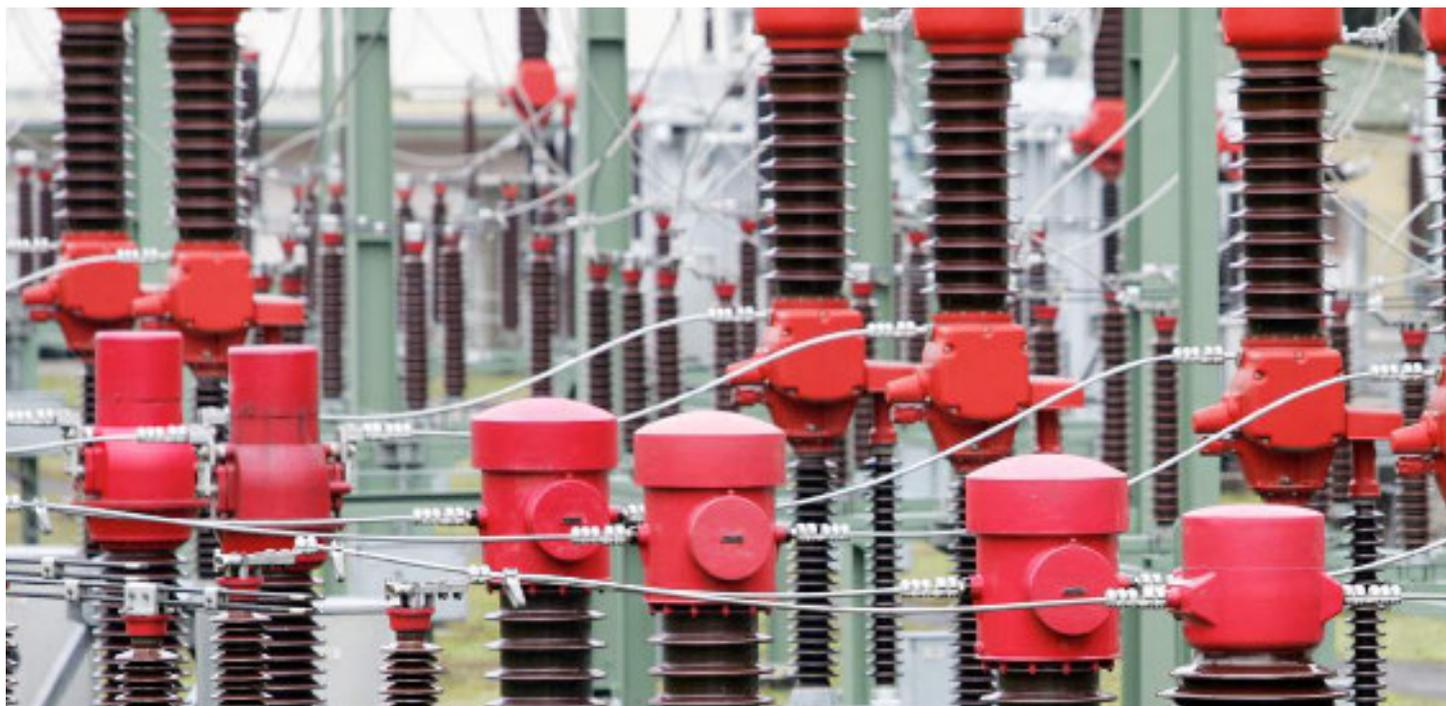
Even today there are two 'Smart Grid standards' for transfer and distribution; one from NIST (National Institute for Standards and Technolo-



gies) and one from the IEC (International Electrotechnical Commission): IEEE C37.118 and IEC 61850.

Standard IEC 61850 is very interesting, but also very complex. It represents a barrier to the entry of small and medium sized enterprises in the industry, but is also the only means of obtaining interoperability between varied devices.

The plant designer, for example, has to use different components (software and libraries) and include them together in the coding. The disadvantages that are entailed for small and medium sized enterprises are considerable: they need to find or train people who can work with such projects; implementation times are longer and this naturally leads to higher costs.



#### **SO WHAT CAN SOFTWARE SPECIALISTS CONTRIBUTE AGAINST THIS BACKDROP?**

COPA-DATA's contribution is to provide a development platform that offers all the required functions: SCADA systems, PLC systems in accordance with IEC 61131-3, a process gateway and native connectivity to over 300 drivers and protocols such as IEC 61850, IEC 60870 and DNP3. All in all, COPA-DATA provides a user-friendly platform that enables the implementation of complex technologies and does not cause the engineers any headaches.

#### **SUBSTATION AUTOMATION IN LINE WITH SPECIFICATION SAS 2006 FROM TERNA SPA**

During his talk at the Smart Grid International Forum, Giuseppe Menin discussed the technological challenge posed by Terna S.p.A, the operator of the Italian power grid. In this context, zenon Energy Edition was tested successfully at station level and, as embedded software, also at field level (bay control unit, bay monitoring unit). Using one single development tool, the SCADA is engineered, the PLC logics in accordance with IEC 61131-3 are programmed, connectivity is ensured in accordance with IEC 61850 and SNMP, and the process gateway is implemented to the telecontrol centers in accordance with IEC 60870-5-104. The bay devices using the zenon and straton software have a high quality user interface, PLC functionality in accordance with IEC 61131 and connectivity in accordance with IEC 61850, including GOOSE messaging. The bay devices are also configured using the same development platform.

#### **WAMS/PMU-BASED REAL-TIME IMPLEMENTATION**

Who could forget the power outage of September 2003, when Italy was

in the dark for twelve hours? Just a few months before, there were major blackouts in the USA and Canada, where 50 million people were without electricity. To avoid such breakdowns, a Smart Grid must be in a position to react independently in the event of problems and to equip itself for critical situations that can cascade out into the grid.

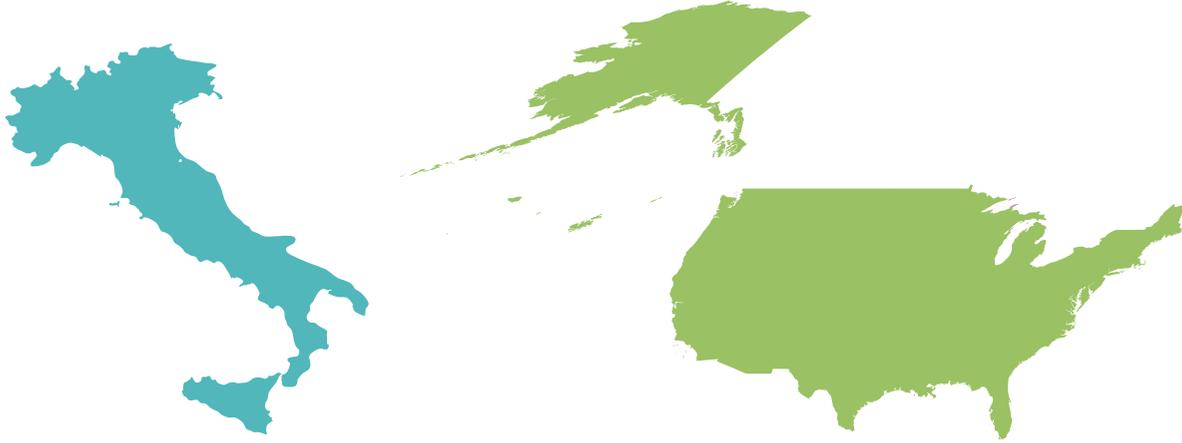
COPA-DATA works together with hardware producers and system integrators in order to create systems that process the information from the PMUs in real-time and can undertake any correction measures that may be required. zenon Energy Edition is impressive for projects in this environment primarily due to its high degree of flexibility and adaptability. We also value real teamwork at COPA-DATA and work with the many different people involved and exchange knowledge with specialists. It is primarily when developing such pioneering technology that problems can occur, which makes it even more vital to collaborate with the different parties involved.

#### **SMART GRIDS: A DESIRE FOR MORE**

With our talk at the first Smart Grid International Forum, we wanted to make energy suppliers aware of the contribution that we can make to the development of Smart Grids with zenon Energy Edition and our years of expertise. At the same time, we wanted to show that the barriers to entry we discussed can indeed be overcome – provided appropriate technology is used and a network of competent partners is available to support you. With the aim of always performing at our best for you, we are working closely with system integrators, mechanical engineers, hardware engineers and software manufacturers in the energy sector. The “Smart Grid” mission is moving into the next phase! We are ready. Are you?  *Giuseppe Menin*







## COPA-DATA ITALY HAS MOVED

## USA: NEW OFFICES FOR CONTINUOUS GROWTH

**Ten years of thriving business** has allowed COPA-DATA Italy to continuously grow. Now it is time to move to larger and more comfortable operational facilities. The new premises now provide more space for technical support, ongoing training, administrative tasks and the Marketing and Sales departments. The new office is very close to Bolzano, in the Frangarto district of the Appiano municipality. It can be easily reached in a few minutes on the main road after exiting the highway from the north or the south. The team, led by Managing Director Klaus Rebecchi, would be happy to welcome you at the modern facilities.

**The COPA-DATA USA subsidiary** has been in operation since 2006. Continued growth means that more space is required. COPA-DATA USA therefore moved to new, larger premises under new management in 2009. The office is now located in Princeton, New Jersey. In the new facilities, it is now possible to carry out various training sessions for small groups. There is also room for diverse automation hardware in a separate technology room. The team at COPA-DATA USA is pleased to have more room to progress and expand further. The new offices are close to Princeton Junction and can be easily reached via public transportation.

THE ITALIAN SUBSIDIARY  
IS NOW LOCATED AT

Ing. Punzenberger COPA-DATA Srl.  
Via Pillhof 107  
39057 Frz. Frangarto  
Appiano Sulla Strada del Vino (BZ)  
Tel.: +39 (471) 67 41 34  
Fax.: +39 (471) 67 41 33  
sales@copadata.it  
www.copadata.it

YOU CAN FIND THE NEWLY RELOCATED USA  
SUBSIDIARY AT THE FOLLOWING ADDRESS

COPA-DATA USA Corp.  
186 Princeton-Hightstown Rd., Bldg. 4A  
Princeton Junction, NJ 08550  
Tel.: +1 (609) 38 50 830  
Fax.: +1 (609) 38 50 829  
sales.us@copadata.com  
www.copadata.us



## COPA-DATA KOREA FOUNDED

In January 2011, our latest national office started trading in Seoul, Korea. With this entry into the Asian market, we are sending a clear signal about our intentions of further international expansion. Many well-known manufacturers and manufacturing companies are represented in Korea, either by their headquarters or a subsidiary, which presents lucrative business opportunities for us. We see great potential, particularly in the Food & Beverage and Energy & Infrastructure. However, we are not entering new territory by founding the office. In the past, we have implemented projects in Asia, but they have been managed from Europe. COPA-DATA Korea will now provide skills, expertise and service locally. The team at the new subsidiary will bring experience of HMI/SCADA automation to bear, PLC programming and system implementation – and is familiar with the particular characteristics of the Korean market. COPA-DATA Head of Global Marketing, Mirjam Riesemann, who has responsibility for new markets, is pleased with the development of COPA-DATA's business in Asia: "The team working with COPA-DATA Korea, under Managing Director Sung-Ho Ryu, is optimally equipped and ready to begin work on new projects. Korea has the ideal prerequisites for entering the Asian market and we are convinced that this initiative will also open the door to other Asian markets."

THE NEW COPA-DATA OFFICE  
IN KOREA CAN BE FOUND AT

COPA-DATA Korea  
550-1 #717, IT-Castle  
Geumcheon-Gu  
Seoul, Korea  
Tel.: +82 (70) 75 10 79 58  
Fax.: +82 (2) 20 26 88 24  
cdkr@copadatakorea.com  
www.copadatakorea.com



## NEW SUBSIDIARY IN POLAND

Eastern Europe is an important market for COPA-DATA. In the last ten years, COPA-DATA has succeeded in building up a solid presence there. Our new subsidiary in Poland will play an important role in further expansion under the management of COPA-DATA GmbH Central Eastern Europe (CEE). COPA-DATA GmbH CEE is also a subsidiary and is based at the company headquarters in Salzburg. It is responsible for a sales region with a total of 19 countries – from Central Europe through Eastern Europe to countries in Southern Europe, such as Greece. Poland was strategically chosen as the location for the new subsidiary for a number of reasons. The excellent economic and political situation as well as Poland's position as a leader in the greater CEE area convinced us to expand and strengthen our presence there. Alexander Punzenberger, who manages COPA-DATA GmbH CEE, is also managing COPA-DATA Poland. His team in Poland already has experience in industrial automation and there are three specialists responsible for management, marketing, sales and technical support. The sales focus in Poland, in addition to the Energy sector, increasingly is the Food and Beverage Industry. However, there are also projects planned in other sectors.

YOU CAN FIND THE NEW COPA-DATA  
SUBSIDIARY IN POLAND AT

COPA-DATA Polska Sp. z o.o.  
ul. Josepha Conrada 51  
31-357 Krakow  
Tel.: +48 (12) 29 01 054  
Fax.: +48 (12) 29 01 054  
sales.pl@copadata.com  
www.copadata.pl

# Who's who?

DANIELA TREIBLMAIR

**Role at COPA-DATA:** Technical Consultant at COPA-DATA Central Eastern Europe. **Responsibilities:** Technical consulting, support for zenon customers in CEE sales regions. **Before COPA-DATA:** For me it was clear at an early stage that I would enter the work force after studying at the HTL Braunau (a technical college in Braunau, Austria). I was anxious to finally put the theories I had learned there into practice. I then came into contact with COPA-DATA at the job fair that HTL Braunau organizes each year. They offered me the job as Technical Consultant, which immediately struck me as a great opportunity. On July 1, 2010, I began my career at the COPA-DATA subsidiary for Central Eastern Europe. **Hobbies and interests:** Outside the company, I like to enjoy time with my friends, my boyfriend and with my family. My greatest passions include activities such as snowboarding, volleyball and photography. **In ten years, I see myself ...:** In ten years I hope to have a nice house and a small family I can grow old with. **My biggest dream:** My family, most of all my parents, are the most important people in the world to me. For this reason, it is my biggest dream to have them around for countless years. **Me in three words:** full of life, creative, communicative.



daniela.treiblmair@copadata.at

JAKOB MIAZGA

**Role at COPA-DATA:** Sales Manager at COPA-DATA Central Eastern Europe. **Responsibilities:** Customer service and zenon sales in the regions of southern Austria, Slovenia, Croatia and parts of Poland. **Beginnings at COPA-DATA:** After twelve years at the forefront of projects in automation, management and sales, I decided to change jobs at the beginning of 2010. I had been familiar with COPA-DATA at that time for over eight years and I immediately wanted to devote myself to what I enjoy most – sales. In the beginning of May 2010, I therefore started my journey as Sales Manager at COPA-DATA Central-Eastern Europe. **Hobbies and interests:** In addition to work, I spend time with my family, including my three-year-old son. He is my biggest hobby and we enjoy DIY projects, painting, reading and discovering things together. He is slowly getting to an age where we can tackle sports such as skiing or cycling, too. **My biggest dream:** I am open to and respectful of all new things in my life and approach them with curiosity. With this attitude, I see a future where our consciousness, combined with our discoveries in technology and automation, make it possible to create a better, more environmentally-friendly and, most of all, balanced world for us and our children. It's a dream that becomes reality again and again and to which I would like to contribute. **Me in three words:** cheerful, open, enthusiastic.



jakob.miazga@copadata.at

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## Strengthening the International Sales Team



Bernhard Korten  
International Sales

**BERNHARD KORTEN** has been working at the COPA-DATA headquarters since September 2008. On January 1, 2011 he moved to the Sales Team and is now working as an International Sales Consultant.

**My responsibilities at COPA-DATA:** Before working as an International Sales Consultant, I was in the Technical Consulting Team. My main duties there included quality assurance of our products, supporting customers regarding all technical issues, and on-site consulting for customers and subsidiaries alike. During my

three-month placement at COPA-DATA USA Corp., I was able to optimize my product knowledge and concentrate on product presentations to new customers. In my role as International Sales Consultant, I am now

responsible for the international sales activities of selected subsidiaries and distributors and the international distribution network. **Before COPA-DATA:** in 2006 I passed my final examination in a “Wood Engineering and Forestry Industry” course at the Salzburg University of Applied Sciences. After this, I worked at a metal processing company for two years, where I was in charge of the Quality Management Department for one year. I have always been very interested in software, hardware and visualization systems. I was also involved in various projects to introduce new software at my previous companies. I used these interests and skills to change the orientation of my career, and therefore came to COPA-DATA, where I am able to fully utilize my technical knowledge. **Hobbies and interests:** I volunteer for the Red Cross as a paramedic. In addition, I enjoy spending time with my family and friends. I like swimming, running and bike riding. **Me in three words:** helpful, cheerful, competent.

BernhardKo@copadata.com

## ESTEFANÍA GARCÍA ÁLVAREZ

**Role at COPA-DATA:** Technical Sales Consultant at COPA-DATA Iberia. **Responsibilities:** Technical support, pre- and post-sales activities, and training in Spain and Portugal. **Background:** My degree is in Telecommunications Engineering. During my last years of college, I interned at different companies where I developed valuable skills in programming and team work. Before I became a member of the COPA-DATA team, I worked as a Project Engineer at Telvent where I was responsible for designing and commissioning control systems. In December 2010, I started as a Technical Sales Consultant for COPA-DATA Iberia. **Hobbies and interests:** I like traveling, visiting new places, getting to know people with different backgrounds, and exploring other cultures. I also like to spend time with family and friends, take sunny walks, and enjoy the small pleasures of life. **Me in three words:** persistent, helpful, loyal.

estefania.garcia@copadata.com



## LOUIS PAGLAICCETTI

**Role at COPA-DATA:** Technical Consultant at COPA-DATA USA. **Responsibilities:** In general terms, I'm the first line of contact for zenon questions from North American customers. Additionally, I'm responsible for customer visits, trainings, and occasional project support. **Background:** In 2004 I graduated from high school unsure of the career path I wanted to take. At the time, I started a job working for the State of New Jersey. After some time, I determined what I was really interested in and what I wanted to pursue. This was Information Technology. I began taking college classes at Bucks County Community College for this and received my Associates of Applied Science degree at the end of May. In May of 2010, I came across a job posting from COPA-DATA USA that was advertised on the web. When I was offered the position, I immediately accepted because I was certain it would be interesting and challenging. **Hobbies and interests:** Outside of work, I enjoy spending time with my family, friends, and my new dog, a Doberman Pinscher. Camping, fishing, target practice, and learning new things are some of my pastimes. I almost exclusively like rock music; you could say from classic rock to heavy metal, and everything in between. I have many favorite movies, but to name a few: Terminator 2, Good-fellas, Avatar and 300 are at the top of my list. **Me in three words:** dedicated, ambitious, result-oriented.

louis.paglaiccetti@copadata.com



## URSZULA BIZON-ZABA

**Marketing Role at COPA-DATA:** Marketing Manager at COPA-DATA Poland, Deputy of Managing Director. **Responsibilities:** Marketing and PR activities in Poland. **Background:** I received my Masters degree in Chemistry from the University of Lodz, Poland, and an MBA from the Polish-American Institute of Business Studies in Cracow. Apart from my academic education, I learned much on my own by attending a variety of sales and marketing trainings and seminars. I like working with people and being part of a team, so I decided to start my professional adventure in sales and marketing instead of chemistry. Before I joined the COPA-DATA team, I gained professional experience in the sales and marketing divisions of Polish and international companies. In 2009, I decided to continue my education. I therefore began my MBA studies at the Polish-American Institute of Business. I always wanted to establish something from scratch, to see it develop, and become more successful step by step. That's why I finally applied to COPA-DATA when they were looking for employees for their Polish start-up subsidiary. Since August 1, 2010 I have been responsible for marketing and customer relationships at COPA-DATA Poland. In addition to that, my daily responsibilities include administrative work and tasks in human resources and finance, among others. My contribution to the establishment of COPA-DATA Poland was one of my biggest challenges and successes. **Me in three words:** optimistic, ambitious, creative.

urszula.bizon-zaba@copadata.at



Fresh, contemporary technology – in our communication, too

# The COPA-DATA Website Relaunch

*“COPA-DATA is fully online with a new website” read the headline of the May 2006 Information Unlimited Magazine (edition no. 12). It was an important feature of the change in paradigm at COPA-DATA. Five years have passed since then. Five years in which not just online trends, but we, too, have continued to develop as a company. These are developments that we would also like to share with you on our website. Form your own impression and visit the new COPA-DATA website at [www.copadata.com](http://www.copadata.com). Welcome!*

The last five years have left their mark on our website – in both a positive and negative sense. It was already evident last year that the website needed some reviving! Not only has online use and reception changed considerably in the last years, but so, too, have the technologies that influence them. The new key terms are interaction and animation.

## **THE ONLINE WORLD RUNS ACCORDING TO ITS OWN RULES**

It doesn't matter if you live on the web or are just an occasional browser – everyone who obtains information online today has varying needs. Think for example of 'infotainment' or multimedia, discussions, playful learning or individualized offerings. Long, demanding texts are being replaced by informational videos; complex structures are being enhanced with modern navigation tools. Nowadays, hardly anyone can afford to spend hours getting to the correct information, and they shouldn't have to – especially within an individual website. Clear flat structures, simple navigation and menus are of the utmost importance. Our project team took all this to heart when tackling the “Website Relaunch” 2010 project.

## **SAID. DONE!**

After countless internal meetings, workshops and consultations with external experts, the project team started to work, step by step, on a list of requirements in spring 2010. They conceptualized and created giant site map posters. Briefings, brainstorming and mind maps were on the agenda. Based on a rough concept, COPA-DATA Art Director, Eva Plainier, developed the first screen designs and, very soon, curious employees could subject the first pages to critical inspection.

## **FOUR MAIN MENUS, MANY EXTRAS**

The new COPA-DATA website is classified into four main menus and

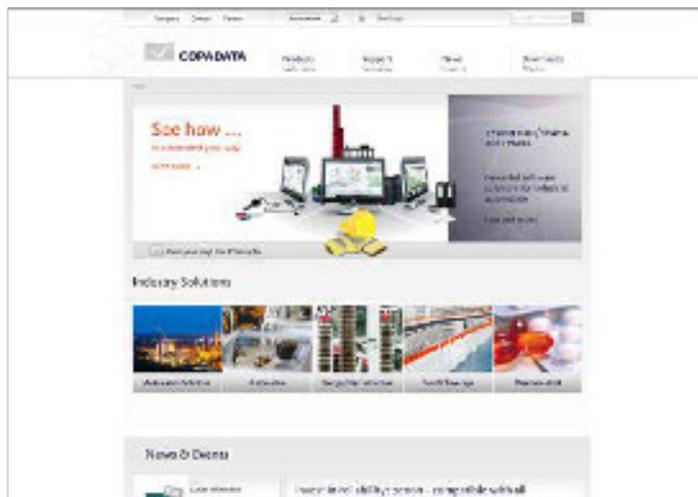
many sub-areas and extras. All important information is easily accessible via the start page and the “Fat Footer” at the end of the page. The four main areas are:

- ▶ **PRODUCTS/SOLUTIONS** contains information on COPA-DATA products and their respective industry-specific applications, functionalities and solutions in the COPA-DATA core industries of Automotive, Energy & Infrastructure, Food & Beverage and Pharmaceutical.
- ▶ **SUPPORT/SERVICES** focuses on the technical questions about our products and services, provides information on training and support agreements and offers many possibilities for COPA-DATA customers to interact with the knowledge base, the COPA-DATA Forum, and the new blog.
- ▶ **NEWS/EVENTS** based on the layout of familiar news portals, this area contains news – prepared in different formats – about products and the company, and it informs you of our ongoing events.
- ▶ **DOWNLOADS/MEDIA** as the name says, we provide all important documents such as manuals, white papers, product brochures and video instructions in the download area. The current zenon software files are also available there for authorized users after logging in. The additional term “media” in the menu refers to further online services such as the “myCatalog” functionality, zenon Compass (“the zenon online experience”) and our corporate publication *Information Unlimited Magazine*.

In addition to these main menus, the new website provides information about the company and the COPA-DATA Partner Community through a few extra menus. Under the additional menus you can find international contact data, change the language settings, login, and search for additional content.

## **THE HIGHLIGHTS AND ADDED VALUE FOR YOU**

- ▶ **Plain structures:** the aim for a simple website also calls for changes to content and structure. We reduced the four previous structure levels to



three and thus subjected the website to a diet as well as a facelift. This did not, however, influence the quality or density of information. The information was not deleted. It is now merely offered in a different form. **The added value for you:** a better overview, better orientation, and easy selection without information overload.

► **Simple navigation:** for the main navigation, the four horizontal main menus already mentioned are available. The four mega menus show what is hidden in the individual areas. In addition, vertical submenus in the individual subpages provide better orientation. Nevertheless, anyone that may “get lost” can use the “breadcrumbs” (navigation paths) to easily locate their own position within the website again. Our new navigation highlight is the “Fat Footer”, which appears at the end of the homepage and on each individual subpage. This provides a clear collection of links and enables simple and quick direct entry to selected areas. **The added value for you:** quick access to information, user-friendly navigation (thread), clarity and improved orientation.

► **Industry-specific content:** we would like to be at your side as the expert contact for individual industry solutions. In our industry sectors Automotive, Energy & Infrastructure, Food & Beverage and Pharmaceutical, we speak your language and show you what our products offer you in the respective industries. **The added value for you:** tailor-made information by clicking a button, easy contact with industry experts, combined know-how, and industry-specific product feature lists.

► **More dynamic features:** optional blend-ins (i.e. in separate windows) or changing content ensures greater dynamics. **The added value for you:** user-friendly, contemporary construction of information in a graphically engaging user interface.

► **More interaction:** in addition to the existing forum, the new website also offers a blog, primarily for the exchange of technical information. In addition, people interested in contributing their ideas to our product

*“The ‘myCatalog’ tool, is a particular highlight of the new website. Instead of imposing a ready-made finished product catalog on you made according to our own ideas, we would like to give you the freedom to create your own completely individual catalog.”*

*Mirjam Rieseemann, Head of Global Marketing*

development can do so directly in our Open Innovation Community by exchanging ideas with our product managers. **The added value for you:** easy to make contact, simple and quick access to know-how and current topics, consultation and joint-design opportunities, communication free of barriers.

► **Videos:** another focus of the new website is moving images of different shapes and applications. An initial selection of videos – from simple explanations of our product USPs through interviews with our industry experts, to online tutorials – is available now. Enjoy watching them!

**The added value for you:** quick, easy finding of information, increased identification value with products and persons, time savings, conversational value, simple reception of information.

► **myCatalog:** we couldn't omit the "myCatalog" tool, a particular highlight of the new website and a characteristic of our *do it your way* philosophy. Instead of imposing a ready-made finished product catalog on you made according to our own ideas, we would like to give you the freedom to create your own completely individual catalog with "myCa-

talog". Decide for yourself which documents you would like to incorporate, the sequence in which these appear in the catalog and the title of your personal catalog cover. 'Fact sheets' (brief information on a variety of product functions), zenon success stories (case studies) and industry-specific white papers are available to select.

#### THE OUTLOOK

Despite the actual website relaunch at the end of May, the project will keep us busy with additional follow-up tasks. Up to now, German and English were the main languages and both sites are online. Currently, further language versions are being implemented. Italian, Spanish and Polish are already in preparation with a number of other languages to follow. The aim is to offer the content in all languages of key significance with respect to countries in which COPA-DATA offices are located. Additional videos and an entertaining and engaging presentation of the COPA-DATA corporate and product history are also in the works.



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# COPA-DATA Technology Services

Active and Individual Project Support



**A new team** has been supporting COPA-DATA employees, subsidiaries, partners and customers since January 2011: Technology Services, also known as TS. After experiencing the value through past projects of example projects, code samples, and graphic expertise from the COPA-DATA experts, we realized that a specific team for this purpose could be highly useful. The new TS Team can configure, design, and provide specialized support for sales-oriented projects on request. It allows, for

example, the COPA-DATA Sales Force to flexibly react to sales-specific challenges. Technology Services' three primary focus points include:

► **Support for Product Management**

TS supports our Product Management department and Industry Managers with the design and creation of industry-specific projects, code samples, wizards (such as conversion wizards), proof-of-concepts, templates, and they contribute to improving the usability of zenon. Furthermore, TS develops binding style guides and usability guidelines.

► **Support for the COPA-DATA Sales Force**

TS supports COPA-DATA subsidiaries and sales partners with pre-sales activities through the creation of demo projects, wizards, code samples, screen designs and graphic templates that are tailor-made for customers.

► **zenon Documentation**

TS creates, administers, and distributes documentation for all COPA-DATA products.

The Technology Services team combines different areas of expertise to ensure the practical design of zenon projects. Employees working in development, configuration, graphics, and documentation are part of TS. The new team, managed by Markus Helbok, has been integrated into our Product Management department at the COPA-DATA Headquarters.

☞ **Markus Helbok**

# Open Innovation

## Inclusion of Customers in the Innovation Process



### WHAT IS OPEN INNOVATION?

Wikipedia states: "Open innovation is opening the innovation process of companies and thus strategically using the outside world to increase the company's own potential for innovation."<sup>1</sup>

According to this, innovation is based on both internal corporate ideas and ideas from the outside world. This means that customers and companies exchange ideas on product development. It's a very simple concept in fact, isn't it? Open innovation has indeed been practiced for nearly as long as products have been developed. However, the challenge is to develop the potential of the ideas in an optimal manner. It is only when new ideas are communicated both ways, yet also discussed in a community and further developed, that meta-objectives can be achieved throughout industry sectors and functions. Furthermore, new ideas and solutions can again be created this way.

### WHY OPEN INNOVATION?

Successful "open innovation" creates win-win situations. Developers and product managers benefit from the practical know-how of their customers in order to be able to continue to improve their products and services. In turn, their customers have the possibility to include their own requirements, ideas and wishes into product development and thus provide a contribution to a product that is appropriate for the market. At the end of a successful open innovation process, there is a product that comes as close as possible to the individual requirements of all people involved.

### OPEN INNOVATION AT COPA-DATA

The fact that our customers can be involved in the design of zenon has been a part of the COPA-DATA philosophy from the start. zenon users regularly provide ideas on how to make the software a bit better. These ideas are discussed by our Product Management department, often together with our customers, and developed further. Many ideas have already gone into the product development in this way and have contributed to making our product the most pioneering innovation software. Even if we cannot implement every idea into zenon exactly as proposed, any feedback is a valuable basis for us to be able to set standards in the market with our products.

### THE ZENON ANALYZER COMMUNITY

We are currently developing a completely new product in the field of "Dynamic Production Reporting": zenon Analyzer. In contrast to our product zenon, which already has an installed user base of over 80,000

worldwide, we can hardly use feedback from our customers for the new reporting tool. However, in order to already be able to benefit from the advantages of open innovation, we have set up a platform for an Open Innovation Community on the COPA-DATA website. In this community, we are introducing our new product, zenon Analyzer, step by step and discussing different ideas with our customers and interested participants. Where is functionality lacking? Which parts of the product should be changed or optimized? How can the product cater to individual requirements? We want to discuss such questions and many more in this community. What are the tangible results from this? As with any innovation process, it is largely open-ended at the start. However, we have made one thing a steadfast objective – the new product from COPA-DATA should excite our customers and confirm our position as the leader in innovation.

If you are interested in getting involved with the development of the zenon Analyzer, please register and become a part of the COPA-DATA Open Innovation Community. We look forward to your comments!

☞ Phillip Werr

[www.copadata.com/get-involved](http://www.copadata.com/get-involved)

*"With Open Innovation customers have the possibility to include their own requirements, ideas and wishes into product development and thus provide a contribution to a product."*

Phillip Werr, Produkt Marketer

<sup>1</sup> Source: [http://de.wikipedia.org/wiki/Open\\_Innovation](http://de.wikipedia.org/wiki/Open_Innovation) (translated from the original German source)







**CONSISTENT,****PLATFORM-INDEPENDENT MONITORING**

Our HMI/SCADA software, zenon, offers comprehensive interfaces and capabilities for importing, in order to record and administer alarms. Thanks to automatic import functionality, zenon can accept message texts from PLC programs as well as the message data points. Because zenon is an open and platform-independent system, diverse control hardware can be used and consistently monitored: the zenon direct drivers ensure that the messages from the production PLC appear in the AML; messages from manufacturing robots can be recorded at the same time. In addition, the central zenon system monitors the network components by means of an SNMP connection. In zenon, users can define filter rules which make it possible to process and forward messages fully automatically; for example, by sending an SMS to staff in charge of particular machines or equipment or by forwarding it to the shift or section manager.

**EASY-TO-USE TOOL****FOR STATISTICAL EVALUATIONS**

In addition to the rapid and reliable analysis of alarms and the rectification of faults, zenon also provides a comprehensive tool to evaluate alarms – the Industrial Performance Analyzer (IPA). This module recognizes weak points in equipment, localizes them and identifies them. The IPA saves the alarm data from different stations in a central database and therefore enables the statistical evaluation of alarms throughout the plant.

The IPA also offers a number of display and filter options for alarms. Users can generate the desired protocols at the click of a mouse and, in this way, could have, for example, the top 10 evaluations of problems displayed according to the cause of the faults and their downtimes. To calculate the duration of the problem, corresponding shift information is taken into account, for example, to automatically calculate net times adjusted for breaks. In addition, it is possible to create reports fully automatically at a designated time, so that they are always available to the Production Management for up-to-date analyses.

In addition to a table display of sum lists or statistical lists, graphical displays of the evaluations can also be generated: the results of the



zenon Alarm Management: recognize and rectify problems easily

analysis are available as a bar graph or pie chart. The statistical evaluation of the alarms in relation to their frequency and duration can provide indications of possible bottlenecks in the manufacturing process. zenon alarm management is, therefore, the optimum tool to consistently and sustainably rectify the causes of problems in production. In this way, Production Management can increase manufacturing efficiency and the productivity of their equipment. *© Bernd Wimmer*

Advanced Conveyer Technology with zenon

# A New Dimension of Logistics

*Modern commissioning and storage systems are the basis for quickly supplying a distribution structure with parts and accessories. The BMW Group uses its Dynamics Center in Dingolfing to ensure that all replacement parts are at the right place at the right time. zenon visualizes the materials handling from the receipt of goods through to the high bay warehouse.*



**The car manufacturer** has created one of the largest replacement part warehouses in Europe with its Dynamics Centre close to the BMW factory in Dingolfing. The building complex covers 153,400 m<sup>2</sup>. Approximately 2,000 suppliers from around the world supply their goods to the central parts delivery centre in Dingolfing. Each individual article is tested for quality, examined and stored. 3,700 dealers worldwide are supplied from the centre. 55,000 transactions are made each day. The receipt and dispatch of goods requires up to 500 trucks and 60 containers each day, which are transported by train. Every year, goods with a total volume of 1.4 million cubic meters are moved. Parts for all types of cars and motorcycles are kept for 15 years. Around 260,000 articles are stored in the Dynamics Centre. The cleverly thought-out logic enables all articles for Germany to be delivered overnight; it takes a maximum of 48 hours for the goods to be delivered to anywhere else in Europe.

#### HIGH-TECH STORAGE WITH ZENON

In order to be constantly competitive in the automotive industry, the central logistics and parts delivery centre must always be as up to date as possible. As part of the most recent expansion, or rather refurbishment, of the Dynamics Centre, the computers processing the flow of material were replaced with a Simatic S7-400 master controller. In addition, BMW also requested a new software solution for the process control level and operation of the control panels, of which there are currently 50. zenon came into play here. zenon from COPA-DATA displays all processes – from the receipt of goods, through internal movement, to dispatch. The solution thus enables the people operating it to know where a replacement part or accessory is at any time.

#### TWO METHODS OF TRANSPORT, ONE SOLUTION

There are a total of 325 chain conveyors on the ground floor. The containers to be transported are placed on or transferred to defined locations on the chain conveyor by means of fork lift trucks. 11 lifting stations, 16 lifting tables, 6 rotary tables and 19 telescopic inverters connect the chain conveyor with the elements of the electric pallet conveyor. They also form the interface between the two levels and methods of transport. The telescopic inverters and lifter bring the skeleton containers with the objects being transported to the upper level, where they are transported by the electric pallet conveyor passed up to 63 four-way points and 7 rotary points to their destination. The electric pallet conveyor is the heart of the internal transport system and serves to bridge the very long distances in the Dynamics Centre. It connects the areas for receipt of goods with pre-packaging, storage, order consolidation and final packaging. The electric pallet conveyor is approximately 6 meters above the facility floor. The conveyor system is 2,650 meters long in total. zenon visualizes the complete conveyor technology on both levels.

#### FOCUS ON SAFETY AND FLEXIBLE ACCESS

Visualization and master control and therefore the overall flow of material are set up as a client/server system (web server) with a server and a redundant stand-by server. Reliable industrial computers with four 19" monitors and a RAID storage system provide additional security and also make a comfortable control room. This is because the employees particularly benefit from one of zenon's features; during operation, the display resolution dynamically adapts to the respective monitor size completely automatically; in this way, the master control visualization is currently displayed on different systems with 2560 x 2048, 1024 x 768 and 1680 x 1050 pixels. For safety, and to be highly accessible, zenon also has alarm management. Thanks to the reports from alarms and reports of events in the system, users are immediately made aware of all critical activity in the process. zenon comprehensively supports BMW maintenance staff in localization and rectifying any possible problems. "High availability and safety were important requirements for BMW. Just as important was flexibility and ease of access to all information at any location in this giant logistics centre", explained the software engineers at Staudinger GmbH.

#### A WELL THOUGHT-OUT FLOW OF INFORMATION

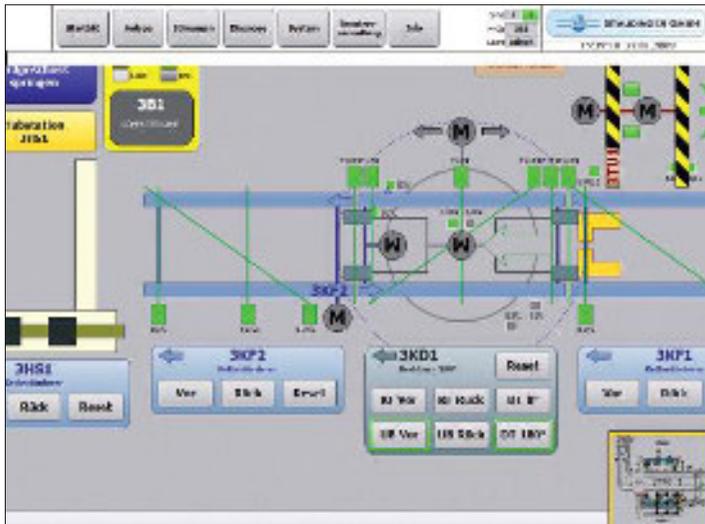
The master control, as well as the seven group controls, ensures that there is a continuous flow of information. The 50 control panels are not connected directly to the master control but instead they are connected to the seven group controls. These move the conveyor technology parts – lifters, invertors, chain conveyors and receive instructions for the respective switch settings, which are determined by means of routing tables, from the master control. The exchange of data between the master controls and group controls is recorded and stored in a database (Microsoft SQL Server). The database also runs on an industrial computer with high availability. zenon ensures that, thanks to the web client, the respective employees can access not only information from group controls but also information from the process control level.

#### EASY PROCESS CONTROL

The SCADA solution records the flow of goods and prepares the data for statistics. In this way, the operators always have an overview of stock levels and can estimate and analyze trends using previously recorded data. The information is saved in Microsoft's SQL database. "Thanks to the easy to use VBA integration in zenon, it is easy to access objects, variables and functions and also to set up user defined analyses – one of the many advantages which this software offers", adds Markus März from Staudinger.

#### SIMPLE PLANNING, TIME-SAVING MANAGEMENT

The previous solution had a deficiency that has now been put rectified:



The conveyor technology in one of the largest replacement parts warehouses in Europe is fully-visualized with zenon.

a separate, independent project was installed on each direct control panel. Each addition and each change to an object therefore had to be carried out 50 times. Thanks to the integrated multi-project administration in zenon, it is possible to define projects centrally and to consistently generate or change all defined objects from one place; once defined, or changed, objects are available quickly and are error free. The possibilities for reusing these objects increase and the effort needed to maintain these is drastically reduced as a result. Markus März also confirms this: “Planning is exceptionally efficient with this. This also means that the customer enjoys an enormous saving in time and cost during the commissioning phase and in particular thereafter, for instance when expanding or making changes to the facilities. I particularly liked the possibility in zenon to activate or deactivate the drivers for the different controls during operation. As a result, the data traffic on the network was reduced considerably for the customer.”

**USER-FRIENDLY SOLUTION,  
IMMEDIATE IMPLEMENTATION**

With zenon, Staudinger has developed an application that is very intuitive and easy to understand. With the previous solution, the employees in the Dynamics Centre worked for over four years on the changeover; however the transition to the new solution was made with relatively little effort involved in training and also went very smoothly, despite the fact that the software was fundamentally different to the existing software. zenon offers a wide range of design possibilities for intuitive and yet demanding process images. One of the functions which made the quick transition to the zenon solution possible is the zenon worldview: the zenon worldview makes it possible to pan across very large images of facilities with the mouse or by using the touch panel. In addition, it is possible to zoom, and add or remove detailed information into the image at any zoom level – comfortably, clearly, efficiently. *Bernd Wimmer*

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# PHARMA SPECIAL

COPA-DATA IS EXPANDING THE SECTORS ON WHICH WE FOCUS. IN ADDITION TO THE THREE CORE SECTORS OF FOOD & BEVERAGE, AUTOMOTIVE AND ENERGY & INFRASTRUCTURE, WE NOW SUPPORT CUSTOMERS AND PARTNERS IN THE PHARMACEUTICAL INDUSTRY.

WHAT DOES THIS MEAN? WHAT CAN ZENON OFFER IN THIS NEW SECTOR? AND WHICH RULES AND STANDARDS APPLY IN THE PHARMACEUTICAL INDUSTRY THAT NEED TO BE NOTED?

ANSWERS TO THESE AND OTHER QUESTIONS ARE IN THE PHARMACEUTICAL SPECIAL IN THIS EDITION OF THE IU MAGAZINE. HAPPY READING!

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# FOUR OF A KIND!

## COPA-DATA AND THE PHARMACEUTICAL INDUSTRY

### A NEW COPA-DATA KEY INDUSTRY – WHAT DOES THIS MEAN?

#### EXPERTS WITH YEARS OF INDUSTRY EXPERTISE

zenon provides advantages in most sectors of the industrialized world dealing with automated processes; each has its own requirements, technical circumstances, and trends. To make zenon the respective sector benchmark, we look to our experts. COPA-DATA has experts for Food & Beverage, Automotive, Energy & Infrastructure, and now, for Pharmaceutical, too. Our Pharmaceutical Industry Manager – Robert Harrison (introduced in edition 18 of *IU Magazine*) – has, in recent months, put everything into ensuring that COPA-DATA and its products are prepared for the diverse requirements of the Pharmaceutical Industry. It is a challenge to which we within the company will also dedicate ourselves in the coming months.

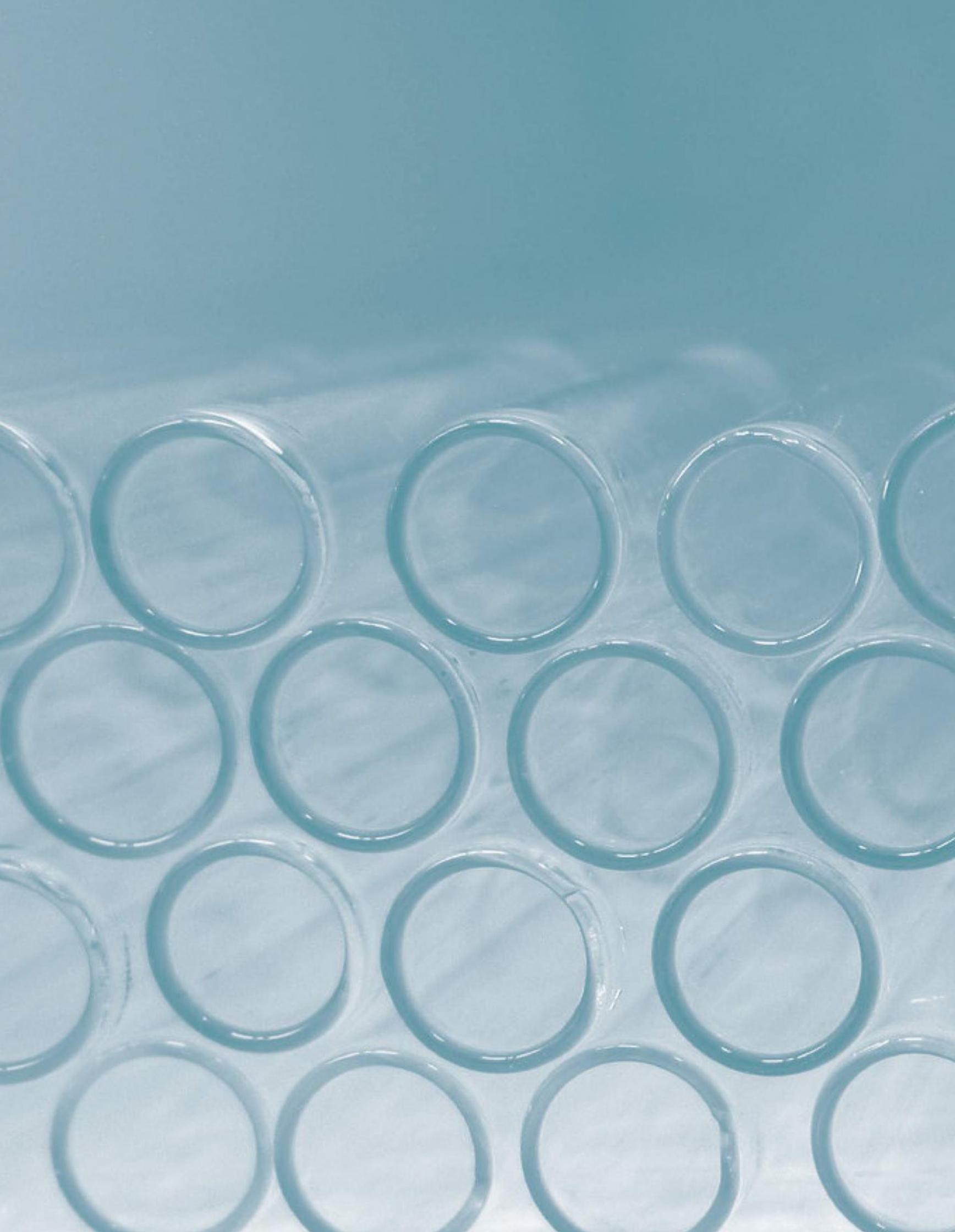
#### PHARMA-READY SOFTWARE

The Pharmaceutical Industry is facing great challenges in the coming years. Expiring patents and the increasing significance of generic drugs are drastically changing the logistics of the sector, efficiency and productivity are becoming ever more important. That's where zenon comes into play. Our software is already very well suited for use in industrial and pharmaceutical environments. zenon measures up to the strict security precautions and legal requirements of the sector due to its strengths in the areas of safety, traceability, and user administration in particular. zenon is classified as a GAMP category 4 product (configured software) and offers industry-specific product features and properties such as Audit Trail and complete compatibility with the FDA 21 CFR Part 11 regulations. Best of all, all of this can be implemented in zenon without programming – simply at the click of a mouse.

To adapt zenon to the industry-specific requirements even more accurately, our industry expert Robert Harrison is currently working together with the Development Team and our Product Management Team to create a separate zenon Pharma Edition, which will be released in the market with the next version of zenon – zenon 7. You can find out more about zenon Pharma Edition in the next edition of *IU Magazine* in the fall.

#### SUITABLE DISTRIBUTION CHANNELS

In nearly all countries in which COPA-DATA is active, there are factories of the world's largest pharmaceutical manufacturers as well as their equipment producers. zenon customers in the Pharmaceutical Industry benefit from our combined expertise in the sector and our decentralized corporate structure. The first zenon pharmaceutical projects have already been successfully implemented in the areas of filling and packaging. Further projects, also primarily in the fields of process monitoring and control, are currently being planned. 



# ZENON IN A CHANGING PHARMACEUTICAL LANDSCAPE

**The Life Sciences Industry** is being subjected to ever higher standards through government regulations, whilst business demands them to do more with less. Elapsing patents are driving innovation and competitiveness in an industry which historically has been proprietary, and safe in the protection that brings.

Current zenon users understand the virtues of a system that creates open and direct communication across production structures, with its full integration of User Security, Audit Trail, Alarm Management, Recipe Management, Analysis and Reporting. Creating redundant flexible systems promotes innovation and opens up possibilities, from standalone equipment to fully integrated solutions.

Flexible and dynamic technology in the Pharmaceutical Industry means transparency of data and protection of production information. zenon brings productivity through modular focused intelligent solutions and creates a secure platform with visibility of actions and complete Audit Trail. This ensures that all data is accurate, trustworthy and reliable.

Using configuration as a base when developing automation solutions limits the validation exposure the equipment is subjected to. The GAMP validation models (explained in greater detail in the third article of this Pharmaceutical Special) dictate that a category 4 product (configured software) significantly reduces validation efforts, and so reduces implementation costs and resources throughout a project's life-cycle. Innovation is preserved, gaining higher productivity through leading-edge solutions.

Putting automation controls across production operations ensure a company they can reach their auditing and regulatory obligations. The dynamic environment that this creates will insulate the customer from ever changing international regulations. It assures investments made

today keep at the forefront of new processes, its quality demands, and that production processes achieve higher goals.

Embracing this industry, COPA-DATA will be releasing two new products that bring innovation and focus to the needs of a changing pharmaceutical landscape.

## **ZENON PHARMA EDITION**

zenon Pharma Edition will encapsulate the needs of such a regulated industry, building on the strong backbone of zenon to streamline production automation; from design to operation, addressing validation and regulation demands. It will ensure critical areas and states are never out of focus, preserving the intelligence needed to innovate on this horizon.

## **ZENON BATCH CONTROL**

The essence of a pharmaceutical production process is batch; all controls serve and pivot around the commands of the batch engine. zenon Batch Control will be a batch engine creating a holistic process environment which no longer relies on third party solutions to cover the entire production process, making our zenon platform pioneer at all levels.

Optimizing the pharmaceutical or biotechnology manufacturing process requires a change in mindset from the proprietary days to the current generation of competitive growth. This is a complex industry requiring skills from different disciplines. It is tightly regulated and highly controlled. In this environment, whether it be a small or large installation, complexity is a way of life. What is important is that we at COPA-DATA establish that all these elements come on board. They are the stepping stones to becoming the automation control system that makes the pharmaceutical business more productive.  **Robert Harrison**



## VITAMINS, VIAGRA OR VALIUM?

### Why Compliance Matters: Regulations in the Pharmaceutical Industry

**Pharmaceutical products are** among the most regulated on the planet. And not without good reason. Take, for example, the comparison between an orally administered drug and food: Food is rarely toxic, even when consumed in extreme quantities, nausea, bloating and common sense will stop somebody from over ingesting food before it borders on being harmful or the condition becomes life threatening. With a pharmaceutical product overdose is easy, and fatal consequences are within reach of most packaged drugs available over the counter.

With food, our senses categorize food groups; simply because they don't look or smell alike, in most cases we can easily determine what is good for us and what is harmful. This is not the case with drugs; the sensor component of smell or flavor is simply not there – a particular tablet

looks the same as another, and they are generally packaged in containers that look alike. So how do we distinguish between Vitamins, Viagra or Valium? The label plays an important part, and under the FDA (Food and Drug Administration) regulations the label is classed as a part of the product. The label displays the border between a beneficial dose and a considerably worse state. But this is not the end of the story, the tablet needs to be consistent in strength and ingredients; one tablet must be the same as any other tablet of this drug type.

A person places their entire trust in the company to produce drugs that will benefit and not fatally harm. Regulations force the manufacturer to provide documented proof that their product works and meets all claims related to its performance.

### WHAT IS VALIDATION?

Validation is not a new concept. It refers to the proof needed to manufacture anything reliably within established specifications. It consists of the data needed to prove that the equipment, materials and processes used in production, when controlled properly and sufficiently, will produce the same result over and over again.

### THE REGULATORY ENVIRONMENT

Regulation places a considerable burden on the manufacturer to prove and document that a product works and meets all claims related to its performance. Regulations vary around the world, but for the most part they use the same information as required by the FDA.

The regulatory process provides everyone with a measure of security that a drug has undergone significant review. However, the process of developing a new drug is so difficult and lengthy that it is not unusual for a researcher at a pharmaceutical company to never work on a drug which gains approval, because only one in five drugs entering clinical trials gains FDA approval.

The manufacturer is accountable for quality, purity, strength and effectiveness of a product. The FDA provides a concept and the expected requirements that a manufacturer can use to prove that a product is produced correctly, and that the processes and materials are the same each time the product is produced. The FDA does not, however, tell a manufacturer how to prove a drug will perform as stated. The FDA basic principles are:

- ▶ Quality, safety, and effectiveness must be designed and built into a product
- ▶ Each step of the manufacturing and packaging process must be controlled to maximize the probability that the finished product meets all quality and design specifications

### THE COST OF COMPLIANCE

Market research suggests that the cost of bringing a new drug to market today ranges from \$800 million to \$1.2 billion and of that an estimated 26% of this cost goes towards the content requirements needed for regulatory compliance.

Pharmaceutical companies must evaluate their existing business and production processes, these processes should be enabled through the use of leading technology solutions; allowing the technology to provide an integrated, collaborative system across the production plant's life cycle. The right technologies can promote compliance and operational efficiency by automating tasks within quality compliance, regulatory documentation and providing evidence. This gives regulated companies the power to enforce compliance and automate the many tasks required, which include:

- ▶ Automate production workflow. Paperless systems with integral audit-trail, security, and authentication. Having these built into a system ensures the process design is compliant from the outset.
- ▶ Optimize through reuse, design once and validate once. Using the same functionality through parameterization brings the concept of a configurable system to a significant portion of the automation facility, directly addressing the cost of compliance by reducing the novelty and risk.
- ▶ Enable easy adaptation to evolving standards. Regulations will continually evolve, therefore technology should allow you to rapidly add new systems or modify already existing ones. A solution which is modular creates flexibility to ensure all automation solutions are accommodated.
- ▶ Focus on ease of use. Your compliant solution must appeal to the people that need to use it – engineers, quality, business users, regulatory professionals, and operational staff. The solution should be able to work



within your existing organizational framework and with the ability to extend and adapt over time.

COPA-DATA's corporate vision – 'To be the heartbeat of the automation industry' – holds these values at its core. Optimization of the automation environment and the design process through easy engineering and independence of hardware promotes flexibility; scalable activity means expanding your know-how across your organization. Whether your system is large or small, a modular approach to full system integration using zenon, straton or zenon Analyzer<sup>1</sup>, delivers the information to the right people in the format they need it; integral functionalities ensure the compliance necessities of audit-trail, security, and authorization.

#### **FDA 21 CFR PART 11 COMPLIANCE**

Computer systems used to collect and manage records must demonstrate to the FDA that regulated products are safe and effective.

Production equipment performing regulated operations must be designed in compliance with performance and quality standards. Validation is the process of proving that any procedure, process, equipment, material, activity, or system actually leads to the expected predefined result. Quality must be built into an automation system during its conceptualization, development, and operational life, and the validation of the system is an ongoing process.

#### **WHICH SYSTEMS SHOULD BE VALIDATED?**

Any computer system performing regulated operations must be validated.

- ▶ Systems that control the quality of the product during its development, manufacturing, testing, and handling processes.
- ▶ Systems that create, modify, maintain, archive, retrieve, or transmit data used to prove the safety, effectiveness, and quality of the product and formulations.
- ▶ Systems that provide information on which decisions are made affecting fitness for purpose of the product.
- ▶ Systems that create, modify, maintain, archive, retrieve, or transmit records that must be available for inspection by a regulatory agency.
- ▶ Systems that provide data or reports that are sent to regulatory agencies.

#### **GAMP**

The FDA finalized the GMP (Good Manufacturing Practice) regulations for finished pharmaceuticals over 30 years ago; the FDA still requires the pharmaceutical industry to produce products using current Good Manufacturing Practices (cGMP). For the FDA to explicitly document its cGMP into regulations would require frequent amendments to those rules, the FDA therefore relies on less formal communications to publi-

cize its evolving expectations, from guidance documents and warning letters. The GAMP guidelines are at the forefront of good manufacturing practice, and are designed expressly for use in the pharmaceutical, life sciences and medical equipment industries; and importantly they focus entirely on automation and not a paper based system.

GAMP 5 gives guidance on validated systems over the whole life cycle of the system; scaling the requirements depending on risk to the product and categorizing the software and hardware on complexity and novelty. If a system is installed in the processing area of production, the risk to the product is high, however, if a configured software is used, within a well known function (e.g. temperature PID loop), the overall implication is low. In contrast, if a bespoke system where functionality is directly and uniquely coded, even for an identical installation, the risk increases dramatically – and with it the depth of validation, as each line of code would then be the subject of review. zenon fits perfectly into this arena: with off-the-shelf functionality and the ability to design once and reuse with parameterization, zenon brings the category of the software component more into the configured domain, and out of the high risk programmed category. The complexity is much reduced, as is the novelty; bringing a system to the regulated customer which reduces the validation effort and, in turn, positively influencing total cost of ownership (TCO).

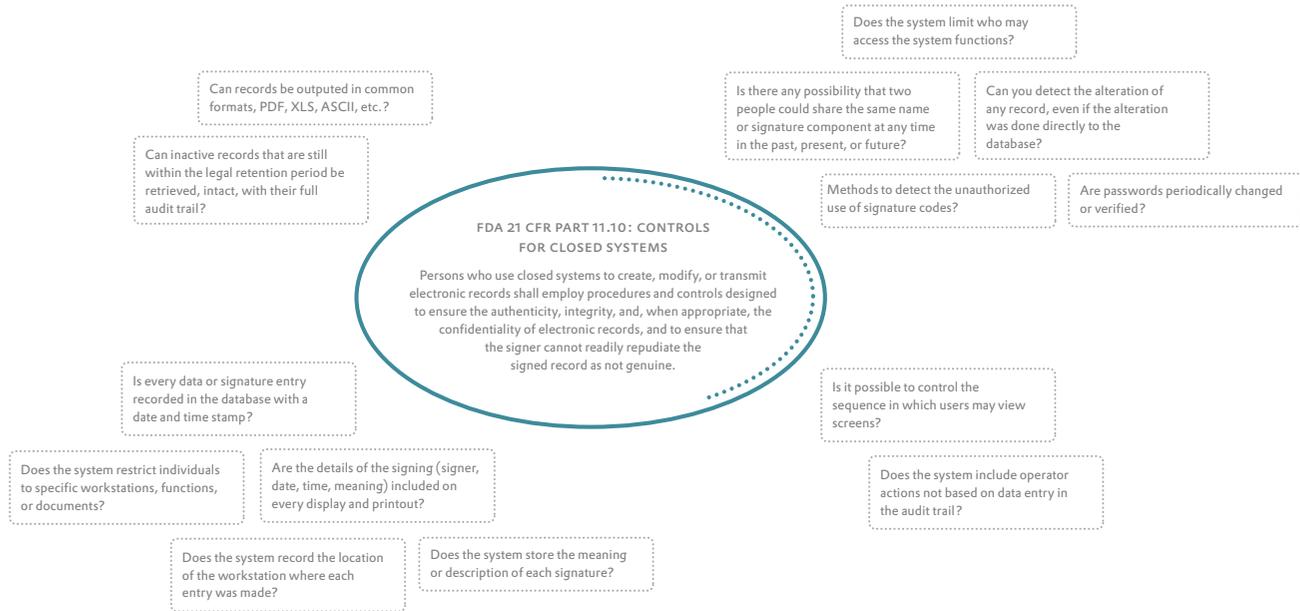
#### **GAMP SOFTWARE CATEGORIES**

- 1 Infrastructure software, operating systems
- 2 Firmware
- 3 Non configured products
- 4 Configured products
- 5 Custom applications

With worldwide regulatory authorities continuing to push for tighter regulations surrounding disclosure, transparency and electronic standards, pharmaceutical companies are increasingly challenged by fragmented electronic systems where paper-based procedures and operations are still used. Many organizations simply lack the process and technology to effectively operate and comply in a rapidly changing regulatory environment. This translates into costly product delays, regulatory fines and lost business opportunities.

COPA-DATA encourages collaboration across the existing or new infrastructure of a production plant, streamlining workflow with integral audit trail, security and authentication; zenon and zenon Analyzer improve regulatory content compliance and keep costs in check. Compliance to regulations through integral functionality reduces costs at every stage of the equipment life-cycle. The 'benefit/cost' ratio of zenon and zenon Analyzer in this environment displays clearly how gains and progress can be made to bring ROI (Return on Investment) in a short time frame with long term benefits for the automation system's life cycle.

<sup>1</sup> The zenon Analyzer is our latest innovative product due to arrive on the market later this year. Classified under the "Dynamic Production Reporting" category it is a reporting tool which produces evaluations and calculations of key figures in the form of meaningful reports and thus provides information to improve the efficiency of production plants. Find out more about the zenon Analyzer in the Fall Edition of the *Information Unlimited Magazine*.



FDA 21 CFR Part 11.10: Controls for closed systems

**SUPPLIER QUALIFICATION**

The history of the supplier and its operating experience within the industry may be regarded as an assurance that the supplier is capable of providing a software application that performs. However, the history of the supplier and its industry operating experience alone are not sufficient proof of performance. For custom-built application software it is normal practice for regulated companies to evaluate the developer’s quality system, including their procedural controls and experience, in order to ensure that the system will conform to the quality requirements defined by the regulated company. Distinct quality management procedures must be in place:

- ▶ Workflows and practices used for the development, testing, and maintenance of the software application.
- ▶ Documented evidence that supports the integrity of the computing environment and the software products developed.
- ▶ Historical data on the available operating experiences.

**Management**

Clear roles and responsibilities, together with quality assurance, must be in place to define the organization and management of the project or contract.

**Documentation**

Detailed software design specifications and verification plans must be documented. Test procedures and specifications, together with the testing data and reports are needed for the inspection audit. The development of the software at each incremental stage for each part or module must be recorded. User and technical support manuals for the software must be available.

**Standards and procedures**

Evidence that the software development process is conducted under documented standards, methodologies, conventions, or procedures.

**Change management**

Documented evidence of the development and testing stages, where the history of each change or modification activity is recorded. Traceability analysis can then be used to identify areas that will be impacted by the change in the regulated company.

**Personnel qualifications**

Documented evidence to establish that the personnel designing, programming and maintaining the computer system have adequate training and experience.

During the inspection of the supplier, the information obtained is analyzed against the acceptance criteria and current company requirements for the validation of computer systems, with the regulatory expectations for the automation environment. A report is produced that documents the audit process, provides information on the current state of validation of the supplier, and what may be needed for compliance. Based on the findings of the audit, this will provide a recommendation on whether the supplier can be used. Any corrective actions that are required must be defined and implemented in order to ensure that a validated state is achieved.

**FDA 21 CFR PART 11 PROJECT COMPLIANCE**

The figure displayed above shows certain aspects of the FDA regulations on a closed system which need to be administered within a project. The list is by no means exhaustive, but aims to show how the FDA text is translated

*“COPA-DATA encourages collaboration across the existing or new infrastructure of a production plant, streamlining workflow with integral audit trail, security and authentication.”*

*Robert Harrison, Industry Manager Pharmaceutical*



ed into actions in the project design. The highlighted points relate directly to the project application, further measures need to be made in terms of associated system interaction and security, with supporting documentation for the project development, and for the use of the application.

zenon brings this required functionality to the project without complication, simply select the elements to monitor and the audit-trail is brought to life via a checkbox. Utilizing the user administration applies authorization and restricted access to elements through simple selection. Therefore user authorization is simple to implement and administer in zenon, with unique user ID, password syntax and aging control; choose local functionality and/or integrate into Windows Active Directory® for central user control. When information needs to be extracted from the system, audit-trail, reports, alarm listings can all be exported in their raw format, or analysis can be engaged to release reports with the information in the format you most need it.

zenon doesn't need any external systems to maintain compliance, indeed, if a distributed network system is in place and the network becomes nonoperational, the local systems can continue logging data, user authorization can be held locally, no data is lost and so compliance is assured – with no loss of production.

#### **CONCLUSION**

COPA-DATA is well placed to face the challenges of international standards. zenon's independence and capability to connect to third party hardware, together with its full catalogue of automation functionality uses tight integrated control to bring audit-trail, security and authorization to any project, and therefore any project is within easy reach of regulatory compliance.

zenon Analyzer bridges multiple systems from zenon and third party systems to bring analysis that is central to business, quality and production needs. The data can be centralized on the zenon Analyzer, or decentralized at the local machine or SCADA where zenon Analyzer only accesses the information when needed, thereby keeping the information where you want it.

Compliance with international regulations and standards in the Pharmaceutical Industry is not just something 'nice to have', it is a mandatory requirement. We take this issue very seriously and continuously enhance our products further in order to maintain the highest level of regulatory compliance that provides our customers with the opportunity to use state-of-the-art technology within their applications.

☞ **Robert Harrison**

Bosch Packaging Systems AG – Packaging technology pioneers

# Ready for the pharmaceutical industry with zenon

*Following increasing sales in the pharmaceutical sector, the machine manufacturer Bosch Packaging Systems AG required a solution for the process control technology and visualization for its packaging equipment. As part of a comprehensive evaluation, more than 20 HMI/SCADA systems were subjected to meticulous analysis. The resulting decision was the selection of zenon from COPA-DATA.*



**Bosch Packaging Systems AG**, a subsidiary of Bosch Packaging Technology based in Beringen in Switzerland, is a global leader in the development, manufacture and sale of packaging and handling systems. Their repertoire includes flexible robotic solutions for varied products such as foodstuffs, animal feed, health and hygiene articles and pharmaceuticals. The packaging technology specialist has 660 employees in over 80 countries on all continents. Previously, Bosch Packaging Systems was primarily active in the Food & Beverage sector, but it is now increasingly supplying the pharmaceuti-

cal sector and also provides professional system engineering for major pharmaceutical projects.

#### **UNAVOIDABLE REQUIREMENT:**

##### **FDA COMPLIANCE**

For applications in the Food & Beverage and luxuries sectors, Bosch Packaging Systems' existing HMI system had been satisfactory – until now. As a result of their strategic decision to increase engagement in major pharmaceutical industry projects, a new solution was required that would correspond to the strict official requirements of the pharmaceutical sector. Their requirements from the new process control system and visualization were clear from the start: the new system must fully meet the requirements of regulation 21 CFR Part 11 of the American Food and Drug Administration (the FDA) and be GMP and GAMP compliant.

The existing system, based on WinCE, was not able to meet these requirements. The Bosch Packaging Systems management consequently decided to evaluate alternative systems. Their expectations were high:



The production display informs the user at Bosch Packaging Systems about all relevant parameters. The upper screen section shows information on the product dimensions (left) as well as machine speed (right). The user can use each input field (center of screen, left) to make offset corrections to the product or foil positioning.

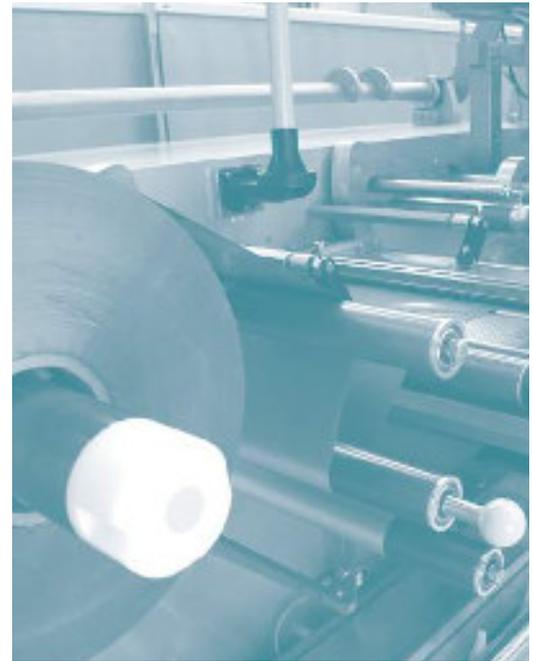
on the one hand, Bosch Packaging Systems hoped to be able to directly influence product development; on the other hand, they wanted to achieve double digit percentage cost savings. Additional criteria in the decision-making process were more rapid and simple engineering for customer projects and the scope for a variety of individual adaptations. More than 20 different software systems from well-known international manufacturers were scrutinized and assessed as part of the evaluation. From this selection, Bosch Packaging Systems ultimately chose zenon from COPA-DATA.

#### WINNING OPENNESS AND FLEXIBILITY

Pascal Witprächtiger, Manager of Software Development and Construction at Bosch Packaging Systems AG, explains the reasoning behind the decision: “We decided on zenon because it is an open system that offers all the interfaces we require for the future. Our customers are looking for complete solutions that can be individually adapted. As an independent system, zenon meets this requirement. It can communicate with other components without problems and, thus, closes existing gaps in the line management. Because zenon is so simple to configure, we can also meet special customer requirements. Additional modules are licensed as required and functionalities can be expanded. Thus, the applications remain flexible and important decisions about functionality and scope can be made by the customer. Our expectations in terms of cost savings

have also been met. Firstly, as a result of the new system’s potential for optimization and, secondly, thanks to zenon’s hardware-independence. Due to the fact that zenon is not bound to particular hardware components, we can open up competition amongst the manufacturers of touch screen panels, which has cost benefits. Another important factor in our decision-making was the company supplying the software. COPA-DATA has international subsidiaries and we can look back over their corporate history, which spans more than 20 years. This gives us security and means we can trust that we are investing in a stable and long-term business relationship.”

With its product philosophy of setting parameters instead of programming and its core values of consistency, independence and compatibility, zenon has been following a somewhat unconventional path since the start of its development. A modular construction, simple configuration, open communication via over 300 of its own communication protocols and adherence to international standards guarantee a high degree of freedom. Lars Krause, a software engineer at Bosch Packaging Systems says: “Generally, the applications that our end customers use can be very different and individual – despite similar industry-related requirements. At one customer we might find control units from Allen Bradley, then Siemens Simotion or Bosch Rexroth with another. However, usually there is a mix of different equipment from different manufacturers – including control units, PCs and operating panels. The greatest



In the “Project Management” screen, the main settings for the current project are adjusted. For example: fading main menus in or out, selecting the language or unlocking special functions such as Remote Access or forced login.

challenge is ensuring reliable and secure exchange of data between all these various devices. With zenon, we can provide our customers with a product that overcomes this challenge and meets all their legal requirements.”

**COOPERATION LEADS TO SYNERGY**

Bosch Packaging Systems uses zenon mainly in two areas of business: firstly, for horizontal hose packaging machines, storage solutions and distribution systems and, secondly, in the field of top-loading, cartoning and Delta robotics. Pascal Witprächtiger concludes: “COPA-DATA has proven to be a strong partner. It has taken on board our wishes and, in the most recent version of zenon, it has integrated some of them as new developments into its product release. For us, it is especially important to be able to contribute to ongoing product development, but without creating special solutions that don't aim to serve the whole industry.”



*“As part of our comprehensive evaluation, we have assessed and evaluated more than 20 systems from different manufacturers. Ultimately, zenon was the clear winner.”*

*Pascal Witprächtiger, Bosch Packaging Systems*



# COMING UP NEXT ZENON 7 AND MORE

WHAT IS WAITING FOR US IN THE NEXT TWELVE MONTHS?  
AND, MORE IMPORTANTLY, WHAT CAN YOU EXPECT  
FROM US IN THE NEXT TWELVE MONTHS?

JUST AS THE THEME OF THIS EDITION OF IU MAGAZINE – A DESIRE FOR MORE – HINTS, WE HAVE MANY GREAT PROJECTS UP OUR SLEEVES. WE ARE CONTINUING TO DEVELOP IN TERMS OF OUR STRUCTURE AND PERSONNEL AND WE ARE GROWING OUR PRESENCE IN DIFFERENT COUNTRIES AND ARE VENTURING INTO NEW SECTORS. HOWEVER, A “DESIRE FOR MORE” ALSO ENCAPSULATES OUR MOTIVATION: THE DRIVE FOR INNOVATION AND NEW PRODUCTS.

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### ZENON PHARMA EDITION

COPA-DATA made its first forays into supplying the pharmaceutical industry some years ago. In 2011, Pharmaceutical has now been named as the fourth COPA-DATA core industry. zenon provides many functionalities that already address the requirements of this sector. The combination of the right product and the necessary in-house know-how has already contributed to some successful zenon projects in the pharmaceutical industry. As a result of this success story and increasing demand, we will now offer a separate zenon Pharma Edition with zenon 7. This will support users optimally with industry-specific tailor-made functions and default settings. Creation and maintenance of GAMP-related projects will become a walk in the park thanks to suitable templates. Furthermore, the zenon Pharma Edition will optimally deliver on the industry's requirements in terms of security and traceability.

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### NEW MESSAGE CONTROL

Reliable system monitoring, including at far-off or distributed sites, is indispensable for today's companies across all industries in order to work competitively and economically. zenon Message Control has played an important role in the reliable management of equipment for many years. As an integral component of zenon Runtime, Message Control can always deliver an overview of the current situation in the facility and regularly informs the operator or maintenance staff of ongoing events. With zenon Message Control, it is possible to reduce downtime and, thus, increase profit. In order to do justice to the important role of this module, there will be a completely new version of it in zenon 7. As a user, you can look forward to a fully reworked interface for engineering. The new zenon Message Control will also impress in Runtime with, for example, the ability to parameterize in Runtime, including for client computers, or with full support for redundancy. Regardless of the challenge: whether a new employee has started with your company, or it simply needs to be guaranteed that a message reaches its recipient or their substitute; be it a message via email, SMS or a voice message – the new Message Control has all the smart solutions.

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### EXPANDED RECIPE GROUP MANAGER

Recipes and their parameters can now be found at the heart of many production facilities. They make it possible to set the parameters of machines or parts of machines. And in the other direction, current settings can easily be read back into the system and documented. For the users, ease-of-use is clearly at the foreground – ideally at the push of a button and without the risk of incorrect input. To be able to better adapt recipes to the realities of everyday production, it will be possible to issue recipes with a status in zenon 7. As a result, individual recipes, for example, can be intentionally blocked and, thus, filtered out for particular users. It is, therefore, impossible to distribute an untested recipe that has not yet been approved. Operating safety is thus increased easily, but very efficiently. This new type of recipe administration is accompanied by a number of further optimizations for operation. Essentially, recipe handling will be even easier and more secure in Version 7, and it will meet all the requirements of the GAMP-influenced industry environment.

The economy appears to be recovering; the economic outlook is getting better again. COPA-DATA mastered the “credit crunch” very well and we have consistently continued on our course for growth, even under difficult conditions. This is evident from the positive revenues and employee numbers, as well as the product expansions. We did not make cuts but instead – on the contrary – continued to develop, in terms of staff and technologically. In 2010 we had a big release with zenon 6.51, which had many new features. In 2011, COPA-DATA is going one better and we are working intensively on a new Dynamic Production Reporting tool, the zenon Analyzer, version 2.0 of which will be presented at the end of the year, in addition to the next zenon version, which will appear on the market at the start of 2012.

With zenon 7, a major release is pending: a product update that is worthy of its own version number due to its many features. The preparations for our next major zenon release started in late summer 2010. When version 6.51 was released, projects that had been put on hold temporarily were resumed, and the industry started to invest heavily again. Time, therefore, to think about version 7 and discuss ideas for the next version with our customers, partners and employees. The multitude of ideas and constructive feedback from ongoing projects quickly helped to inspire us and supplemented our internal catalog of requirements. Our customers and markets were the ultimate motivation for us to bring the new zenon release to market quickly. What are the highlights of zenon 7? Read on and get a surprise or two! *Reinhard Mayr*

## WEBCLIENT

FÜR MOZILLA FIREFOX, GOOGLE CHROME,  
APPLE SAFARI AND – HTTPS

Our commitment to independence is an essential part of COPA-DATA's identity and it is also reflected in all our products and solutions. We give you the freedom to select your preferred Windows platform and we give you the zenon driver concept, which makes it easy for you to communicate with any control units from any of your preferred manufacturers. Now we transfer our philosophy of freedom seamlessly into the web – with zenon 7: so that you can choose whichever browser you wish to use, our new plug-ins are available for all commonly used browsers. However individual your requirements for IT and security may be, zenon is flexible and supports your preferences. Plus, for security: with zenon 7, the transfer of data across the zenon network to the web client can be encrypted. The Advanced Encryption Standard (AES) is used.

zenon is in use as a control system in many manufacturing companies, including in companies with batch-based production. In conversations with users, we are always confronted with the same challenges: a Production Manager should, on the one hand, increase productivity but, on the other hand, must reduce costs and naturally adhere to all the binding directives and standards that relate to the process. To this end, a system is needed which can provide information for informed decision-making. But this is not enough. The ideal system should also reuse this data to optimize production and, most of all, control in a flexible manner. The new zenon Batch Control meets these requirements exactly. It is a batch management system based entirely on the ISA standards S88 and S95. As an integrated part of zenon Runtime, it automatically monitors all relevant production data and potential problems. Production operations can thus be adapted efficiently and flexibly according to current requirements. The objective of the module is to control the running of processes dynamically, i.e. to be able to intervene in the on-going process without negatively influencing the production system. In doing so, the module offers flexible handling of all significant elements such as master recipes, recipe parameters or conditions in Runtime. Our first priority has been to ensure the solution's ease of use. We've also fastidiously observed legal requirements and included functions to help you meet them. All actions can therefore be logged without exception and all user actions are password protected. zenon Batch Control will surprise you: the most up-to-date process control really can be this simple and flexible.

## BATCH CONTROL

# In the 'Cockpit' of a Food & Beverage Plant

## Real-time Key Performance Indicators with zenon

*Have you ever visited a production line in a Food & Beverage manufacturing plant? If so, you very probably remember the dynamics of the production area: many different machines working together on each line. Often a large variety of different products must be produced, as rapidly as possible and to the highest quality. To stay competitive, the production teams at this kind of plant face ever more complex pressures to optimize products and processes. Modern control and monitoring systems help, of course, but these production teams must manage a wide variety of parameters and deal with huge amounts of online and historical data in order to keep track of all processes and events.*

**The challenge to interpret** this data must be something like being in a helicopter cockpit. Just imagine it – full of gauges, dials and displays detailing important information about altitudes, pressures, temperatures, radar and so forth. The cockpit displays an enormous amount of vital information and the pilot must make sense of it in order to keep the helicopter in the air. In Food & Beverage manufacturing, quality and consistency have the potential to be 'life and death' matters too. In addition, quality and consistency must also be balanced with financial concerns: the drives to optimize the speed and efficiency of production. So what is the vital information that the 'cockpit' of a Food & Beverage plant should display?

Typically, process automation systems deliver a huge amount of data, but it isn't the quantity of available data that is the critical success factor. The production teams need relevant and aggregated information instead of just data. And the clarity of this information is vital. Information should help production teams to take corrective actions immediately, where they are needed, so business objectives can be met. In short: they need real-time information which enables rapid and flexible responses. Information that helps teams to achieve their stated business objectives is vital – and the most important statistics form the basis of the plants' Key Performance Indicators (KPIs). These KPIs are calculated to make the 'cockpit' of Food & Beverage plants easier and

less risky to control. Standards such as DIN 8782 or Weihenstephan inform the definition of KPIs and describe how they can be calculated. One important KPI in Food & Beverage manufacturing is Overall Equipment Effectiveness (OEE) – a well-known indicator calculated from important equipment ratios pertaining to availability, performance and quality. The machine operators, the Packaging Manager, maintenance staff and the Operations Manager may have access to different information, based on what their role requires. But, by using real-time KPIs, they become a more effective team, because they know where to focus activity for maximum impact on results and profit.

zenon has been developed to have an active impact at the heart of production processes – so a zenon system can perfectly deliver real-time KPIs. zenon's contribution ranges from data acquisition to KPI presentation (see table, next page). When you deploy zenon to deliver real-time KPIs, you can expect a high return on investment (ROI) because:

- ▶ The system is ready to be connected to various and heterogeneous production equipment: old or new, with different functionalities, from different suppliers – whether during initial development or at a later stage, as processes or information requirements change and develop.
- ▶ Complex online data processing supports the implementation of standardized or customized KPIs.
- ▶ The system ensures flexible extensibility.

- ▶ The clarity that zenon's graphical capabilities and ease of engineering bring to the display of information reduces the probability of mistakes in interpreting KPIs.
- ▶ Out-of-the box and configurable modules allow easy system engineering, including the development of complementary tools for KPI-related process analysis.

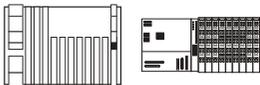
What KPIs do you use to monitor your production processes? Are you interested in KPI benchmarking? Are you involved in engineering solutions to capture, display and report KPI data?

I'd love to hear your feedback. Email me: [Emilian.A@copadata.com](mailto:Emilian.A@copadata.com).  


## ZENON'S CONTRIBUTION

## YOUR BENEFITS

1

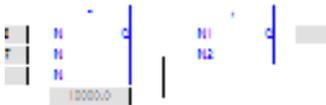


### Data Acquisition

over 300 communication protocols

Access to any relevant production data from any production equipment or device, for real-time KPI calculation

2

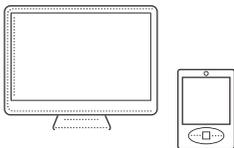


### Data processing and KPI calculation

- Mathematical drivers
- straton (IEC 61131-3 PLC Programming)
- VBA/VSTA (.NET, C#) Programming

- Freedom to choose between different ways to implement real-time data processing
- Create calculation libraries so you can re-use KPI calculations

3

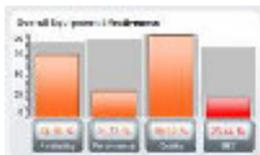


### Information sharing, including KPI data

- Client/Server on all PCs, HMI panels and mobile devices in a network
- WEB Server over Internet/Intranet
- Message Control (SMS, e-mail)
- Communication with alphanumeric displays

- Distributed and rapid delivery of real-time KPIs to all members of production teams
- Cost-effective extensibility of the system

4

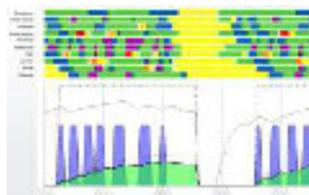


### KPI presentation

- Dynamic graphical objects
- System/user symbols
- WPF elements
- ActiveX objects

- Modern, clear and coherent display
- Easy integration
- Simple solution engineering

5



### Complementary information

- Alarm and Event Management
- Trends
- Reports

Additional support for even deeper and broader data analysis of production processes

## The Work-Life Balancing Act

# A Hands-on Approach to Promoting Good Health at COPA-DATA

*Every two weeks, an important visitor comes to visit the COPA-DATA employees at the Salzburg Headquarters. A man in white trousers and sandals enters the building, radiating peace, strength, satisfaction and an energizing motivation. He is always laden with a large bag and enters the building in a contagiously good mood. He greets the receptionist with a friendly smile and walks purposefully into the COPA-DATA meeting lounge. It is a scenario that has awakened the curiosity of the IU editorial staff. Who is this man? Why does he visit here so regularly? And most of all: what is in his bag? The IU editorial staff investigates and a name is given. A starting point from which to question the protagonist himself.*

**IU: Mr. Ganner, you regularly visit COPA-DATA. What is your connection to the company? What brings you here?**

I come to COPA-DATA to treat the employees to a bit of relaxation and to get their energy flowing through mobile shiatsu. For those who are not familiar with shiatsu: “shi” is Japanese for thumb or finger. “Shiatsu” thus means ‘the finger pressure’; we are talking about manual physical work. In the broad sense, shiatsu is a form of massage, but shiatsu is something special. What is different about shiatsu? In the body, there are energy paths, along which ki flows. Ki – sometimes known as Chi or Qi – is energy or our ‘life-force’. It is the pathways along which this flows that are treated in shiatsu. The soft, steady pressure on tsubos (acupuncture pressure points) along these paths regulates the ki. Shiatsu is one of the most efficient ways of overcoming stress.

But back to your question: I carry out mobile seated shiatsu every 14 days at COPA-DATA for the employees. The basic objective of the treatment is to relax the employees – whose work is mainly long work in front of monitors – and to work against muscular tension. The focus is on relieving stress in all its different kinds. Also, members of corporate management consistently take part. I aim to increase the sense of happiness of both the employees and the employer, so that the performance and the motivation in the company are maintained. There is a boom in corporate health promotion at the moment. The various benefits are very

much welcomed by management. Nevertheless, in today’s society the demands placed on employees are bigger and bigger and the time spent at work is becoming longer and longer. With mobile shiatsu, a company is making a long term investment in its employees and doing something good for them.

**U: For how long has COPA-DATA been investing in this ‘good thing’ for its employees? And how did the collaboration come about?**

I got to know the CEO, Thomas Punzenberger, during an Aikido training course in Seekirchen. At the time, we talked about a wide variety of things, including shiatsu, and I told him about our mobile shiatsu. This interested him and he invited me to an open day at the COPA-DATA Headquarters in Salzburg, where some employees tried out mobile shiatsu. This was in March 2008. Since then the employees have enjoyed the vitalizing effects of shiatsu at regular intervals.

**IU: For all those who have not yet had the pleasure of a shiatsu massage, what happens during the treatment? Is the treatment always the same? What extra apparatus do you need?**

Shiatsu is generally practiced on a soft mat on the floor. This is how it is done in Japan. The work on the floor is ideally suited for the finger pressure to originate from the center of the body or abdominal area (hara) of



the person giving the treatment, i.e. it is created from the hara. For mobile shiatsu at the workplace, it is recommended that a special chair, which was developed in the USA, is used. When sat on this, the ideal body posture is achieved, like an infant being carried in the palm of the hand. It is best described as a mixture of kneeling, sitting and leaning. It is certainly a very pleasant body posture and the chair is better suited for the office environment than the mat. At the request of the company, we also offer shiatsu in the office on a mat. However there must be appropriate facilities for this.

Each treatment consists of several phases. In the “warm-up” phase, it is important for me that the employee rests and achieves a state of deep relaxation. In the “mobilization phase” I treat areas of the body that are under particular strain during office work, such as the shoulders, neck and back. At the end of the 25 minute treatment, there is an “activation phase”, in which I get the body and mind going again using stimulating impulses. After the massage, employees should leave refreshed and be able to tackle subsequent tasks with renewed vigor. I use some shiatsu techniques repeatedly; others I use according to individual requirements. If, for example, somebody says that they have a certain complaint, I would naturally take that into account and adapt my treatment and select the pressure points accordingly.

Shiatsu does not need any extra apparatus. However, I work with music in the background to help anywhere where there is a distracting amount of noise due to adjacent offices or meeting rooms. The sounds and melodies help to relax and to create a certain distance from the working environment. This is ideal to help “switch off”. Office work is inherently linked to a lot of mental exertion – the music invites people to explore nice places or form images in their mind. This supports the regenerative effects of the treatment.

**IU: Shiatsu treatments are usually offered in the practitioner’s own practice. What inspired you to offer mobile shiatsu and how is this service received by the companies?**

I finished my training in 2006 and then attended a conference held by the

German Shiatsu Association. At this conference, we took part in a workshop for “mobile shiatsu in a company”. This topic was presented with great enthusiasm there. We were all for implementing this idea in Salzburg. It was clear to us that we could only implement such a service as a team on a larger scale. Together with two colleagues, Maria Auer and Eva Hübler, we started as a team called “workImpuls” in autumn 2006 with mobile shiatsu for corporate health promotion. The KI written in capitals stands for the energy of life, a fundamental tenet of Eastern thinking and traditional Chinese medicine. workImpuls thus means “setting an impulse with KI at work”. What affirms our course of action and really makes us happy is the fact that some companies which were with us from the start are still with us. The strength of our team in particular is that we can treat a large number of employees in a company at the same time and at short, regular intervals. But the range of services we offer is wider than just shiatsu. It also includes ki training, nutritional advice, stretching meridians, activating self-acupuncture and much more.

**IU: This adoption of this special service is naturally connected to its corresponding costs. How is “mobile shiatsu for the corporate promotion of health in the company” financed?**

In the long-term, our experience is that the ideal is if both the company and the employee pay an equal share of the costs of the mobile shiatsu. This provides an impetus for people to take responsibility for their own health and also promotes employee satisfaction. As a short term or one-off measure – for example, as an employee incentive or for a health day or such like – it could be fully financed by the company. At COPA-DATA, the majority of the cost is paid by the employer.

**IU: As a regular visitor to COPA-DATA who has already got to know many employees, have you gained an insight into what goes on here? What impression does the company give you? What does COPA-DATA stand for, from your perspective?**

In my opinion, there is a very good working atmosphere and working environment at COPA-DATA. The facilities are great and the nice view of the



mountains naturally offers optimum conditions, not just for shiatsu treatment. It is noticeable that so many young people work at this company. As far as I can tell, the work carried out here involves much concentration, creativity and innovation. As a visitor, I feel very welcome here and am accepted in a friendly manner. I know that COPA-DATA makes software – however I do not know the details. But I can say that the organization in relation to mobile shiatsu is exemplary and works without a glitch.

**IU: As you may know, COPA-DATA's product is called zenon. What do you associate with this?**

Mmmhhh ... that's a difficult question. Maybe a mythical creature from Greek mythology? I naturally notice the name zenon because it is in the advertising in the company and thus has a high presence. However I cannot say what the name stands for exactly. I associate something strong, that has much energy and can rise to great highs if need be. This may also be connected to the logo, which contains a character that arouses thoughts of "rising to great heights".

**IU: Shiatsu Massage is a healing art of relaxation and regeneration. Can you tell us the most important aspects of the treatment? Why is shiatsu, in particular, a meaningful addition to everyday business life?**

People are constantly confronted with pressure, pressure to perform and tension every day. There is always some requirement to be met. This situation can be very draining for employees over a long period of time. It is therefore important now and again to consciously retreat and ensure that this drain is balanced out. Today, most employees are so performance-orientated that they even condition themselves as a performance machine. This is not good over a long period of time. Health problems, such as high blood pressure, sleeplessness or a slipped spinal disc are often the consequences. It is certainly not healthy for mind and body to power out for long periods of time and to drive yourself to the limit to be able to carry out your work. The state cannot afford early retirement; the burden on the health system cannot be borne. For this reason I find mobile shiatsu great. Performance, yes, but in sensible doses and balanced out with

corresponding pauses. Shiatsu is an impulse for relaxation. It helps to get a more conscious feel for yourself and to perceive your breathing. It is important to have an awareness of your own body and to correctly interpret and implement its requirements, such as sleep, relaxation or healthy food. The treatment should also inspire you to become more active and understand what does you good. Leisure is also required for a balance and ultimately everybody must take care of this themselves. Shiatsu opens up a possibility for sensibly creating your own work-life-balance. The relaxation gained from it is by no means just physical, but also mental. It gives you fresh potential for creativity and unused resources are set free, according to the motto "treat yourself to a break!".

**IU: Mr. Ganner, many COPA-DATA employees see your shiatsu treatment as a benefit and source of energy that provides energy for day-to-day life. What are your sources of energy? How do you load up your energy cells?**

In the hammock in my garden – this is pure relaxation. And I also like to relax by cooking. If I cook for an hour, I feel properly rejuvenated. I gain energy from nature: going out for a walk or jogging. I like to retreat into nature and simply perceive the smells, colors and moods. Where I live, Seekirchen, offers the ideal conditions for this.

**IU: Many thanks for the interview.**

*"For me, shiatsu is a pit stop for mind and body."*

*Markus Wintersteller, Technical Consultant*

*“Mr. Ganner makes you relax quickly with his commitment and technique. The half hour of shiatsu that I treat myself to during the working week is one of those moments in which I can really consciously ‘go under’ and ‘let go’.”*

*João Gomes, Technical Consultant*

**BRUNO GANNER (PHD)**

While searching for an answer to the question “What is the meaning of life?” Mr. Ganner decided, in 1979, that he would study biology in Salzburg. The perspective which was presented to him was primarily from the Western cultural point of view, according to which natural science and biology consider only the material aspect of living things, and this appeared one-sided to him. This inspired him to consider Eastern philosophy in great detail. In 1987, Mr. Ganner began practicing various Eastern meditation and movement schools, including Tai chi chuan and Aikido. In 2002, he started shiatsu training at the Shiatsu School in Salzburg. Mr. Ganner has been a qualified shiatsu practitioner since 2006 and has two shiatsu practices – in Salzburg and Seekirchen. His central motto for life is “building bridges between Western scientific and materialistic philosophies and Eastern spiritual and meditative philosophies and growing from this connection as a human being.” His driving philosophy behind the company: healthy and motivated employees are the basis for any company’s success in the long term.  **III**



Shiatsu-Praxis Dr. phil. Bruno Ganner  
Certified Shiatsu Practitioner and  
Health Consultant  
Telephone: +43 (6212) 20 015  
kontakt@shiatsu-ganner.at  
www.shiatsu-ganner.at  
www.workimpuls.at





# FAQs

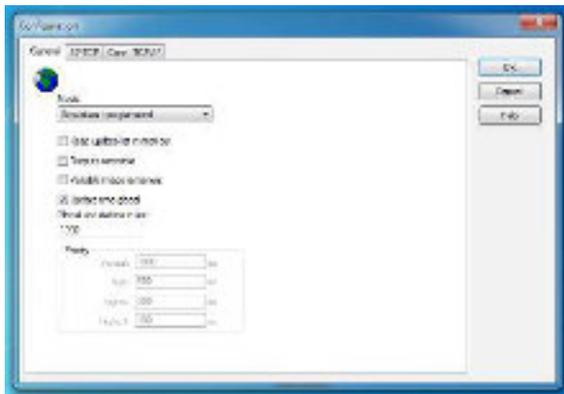
We're spilling the beans in this three-part IU series. In the first part, you received some insider tips on the topics of "Diagnosis Viewer" and "Driver Analysis". This time everything is about communication, performance and simulation. Our experts in DAP (Data Acquisition and Processing) will reveal to you how you can fine-tune existing infrastructures, trim your drivers for optimal performance and simulate the behavior of connected controls. You can find further FAQs, tips, and tricks at our online forum at [www.copadata.com/forums](http://www.copadata.com/forums).

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## [PART 2]

# PERFORMANCE AND SIMULATION

MARKUS WINTERSTELLER  
URSULA PIELA  
BERNHARD SCHUIKI



Options in the driver dialog

### How can I optimize communication in zenon?

In the fast-paced IT world, improvements are continually being made: processors become faster, memory capacity becomes bigger and bigger; networks achieve higher and higher bandwidths. Similar improvements happen in the world of process automation: control systems become more and more powerful, bus systems become faster and faster.

However, existing automation installations appear not to follow this trend: control systems may have already served reliably for more than ten years, bus systems may continue to work robustly. No wonder the saying "never touch a running system" is part of the fixed repertoire of the automation industry.

However, you do not necessarily need to touch your existing equipment in order to optimize communication using zenon. Some options in zenon and in your zenon driver can help you distribute communication in a way that makes for really efficient communication.

Let's look at a couple of 'tweaks' you can make to optimize communication:

#### OPTIONS IN THE DRIVER DIALOG

##### Keep Updatelist in Memory

By activating this checkbox, variables that have been requested once continue to be requested by the control system, even if they are no longer currently required.

Advantage: for example, screen switches can be sped up, because, after first being switched on, the variables do not need to be requested again. Possible disadvantage: A greater load is placed on the bus system because of increased communication.

Conclusion: weigh up whether you would rather reduce the communication load or the screen switching time.

##### Updatetime Global / Priority

This option primarily concerns drivers that request values cyclically. If this option is activated, the set "Updatetime Global" is used for all of the driver's variables in the project. That means that all variables are constantly requested by the control system. If the option is deactivated, the variables are requested according to the priority classes that have been set. Variables are allocated into priority classes in the address op-

tions of the variables themselves. To optimize communication, first it is necessary to determine which variables must be updated at very short intervals; for example, variables used for direct switching actions, especially where it is vital that the button reacts without a delay. For these variables, we recommend to set the highest priority class, because it implies a very short update time (smallest possible value = 100 milliseconds). Furthermore, there may be certain variables that contain process parameters or values that are written to archives. If the archive values are only scanned in minute cycles, it is not necessary to read the values in second cycles. If the values are shown on the screen, it is usually sufficient to have an update value of two seconds. For values that are not shown or are pure service variables, even higher update times can be set. The result of this optimization is that operating values update very quickly but the visualization of them places only a small load on the control and the bus system.

#### **Should I use a few drivers with many connections, or many drivers with just a few connections?**

For drivers which permit several connections, particularly in large projects, the question arises as to whether only one driver should be used, with all connections being configured on it, or several drivers should be used instead?

If Windows CE is used, a driver can only be started once, so it is essential that all connections are created on this single driver. However, on a PC a driver can be started multiple times.

#### INDEPENDENCE OF THE CONNECTION

The strongest argument for choosing several drivers is the independence of connections. The individual driver connections are processed in succession. In the event of a problem, a connection is requested several times before moving to the next connection. If a control in the list cannot be reached, it may have negative implications on the update times of the other connections. In this context, optimization is achievable simply by extending the waiting period for errors.

#### BASIC LOAD PLACED ON THE MEMORY

If there are many connections and a driver is created for each connection,

the basic load placed on the memory will be approximately 5 – 12 MB, which would cause approximately 1 GB of memory to be used if you had 100 connections. With utilization such as this, it would be absolutely reasonable to combine some connections. For example, by creating 10 connections per driver the number of drivers required is reduced to 10 and, therefore, the basic load placed on the memory is reduced to approximately 100 MB.

#### **Is there a method of simulating the behavior of a connected unit?**

It is not always possible to connect to the equipment's control unit – particularly during application development. In this scenario, it is virtually impossible to test zenon functions which are dependent on the control unit, particularly those functions in which the time characteristics of the control unit play a role.

It was precisely for this reason that “driver simulation” was introduced to zenon in version 6.50. This feature makes it possible to create a simulation project for each driver. This simulation project corresponds to a straton project, with the distinction that all driver process variables are additionally made available. It is, therefore, possible to simulate the behavior of the control unit using the familiar environment of the straton Workbench. Once the simulation project has been created, the driver mode must have the parameters set to “simulation – programmed”.

↳ *Markus Wintersteller*

Improve zenon Runtime Performance

# Store VSTA Program Code in its Own Thread

With integrated VSTA, possibilities open up in zenon that could not previously be implemented using conventional VBA. One of these is the use of multi-threading, which I would like to explain to you in more detail in this article.

**When using VBA/VSTA**, it is possible that, when executing long program codes, zenon Runtime (RT) will wait; for example, when parsing XML files or when using Windows message boxes. zenon will wait until the XML has been parsed or the message box has closed. During this period of time, no variables can be written to or read from the control, which can lead to data inconsistency. The problem arises because VBA/VSTA calls from macros, and the triggering of events must be in context to the Runtime thread. If a macro is executed or an event is triggered, the Runtime thread must wait.

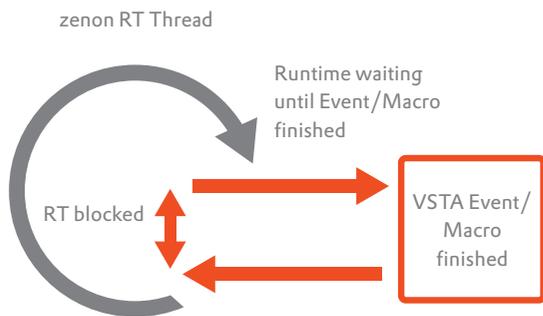


Figure 1: zenon Runtime without threading

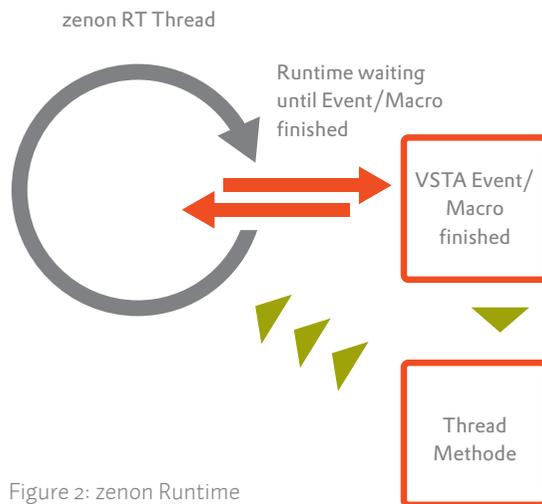


Figure 2: zenon Runtime with threading

To avoid zenon Runtime waiting, using VSTA it is possible to store the methods or functions of the event or the macro in its own thread using “namespace threading”. Once the new thread is started, Runtime no longer has to wait. VSTA or .NET multi-threading thus offers a major advantage over VBA, which only permits single threading.

## NAMESPACE THREADING

The first step is to set up a separate class with the name “ThreadContainer”. The “zDoSomething” method is stopped for 15 seconds using the “Thread.Sleep” method. This simulates the processing of a long piece of program code that would block Runtime if it were executed directly in a macro or event.

The method is declared and started as an independent thread in the event for handling variable alarms. After the thread is triggered by “Start()”, a new thread is created in the Runtime process, which runs for 15 seconds until it completes. By contrast, the event completes immediately after the start method is executed. Runtime no longer waits.

### C# BEISPIEL

#### NEW CLASS THREADCONTAINER

```
namespace ProjectAddin
{
    class ThreadContainer
    {
        //Do something in this Methode
        public void zDoSomething()
        {
            System.Threading.Thread.Sleep(15000);
        }
    }
}
```

#### PROJECTADDIN

```
using System.Threading;

//procedure is executed when an Alarm comes
void zAlarm_AlarmComes(zenOn.IAlarmItem obItem)
{
    //Create a new Instance of the class ThreadContainer
    ThreadContainer myThreadContainer = new ThreadContainer();
    //Create a new Thread which start the Methode 'zDoSomething'
    Thread myT = new Thread(myThreadContainer.zDoSomething);
    //Start the Thread
    myT.Start();
}
```

## TRANSFER PARAMETERS

Parameters can also be transferred to a class. In doing so, it should be noted that only the parameters which are still valid after the macro or event has completed are transferred. In the next example the “obItem” object is transferred using the class constructor and the required parameters are immediately written to local variables for further processing. This ensures that these parameters are also valid within the class after the event/macro has completed and their objects have been destroyed.

### C# EXAMPLE

#### THREADCONTAINER EXPANSION

```
using System;
using System.Collections.Generic;
using System.Text;
using System.IO;

namespace ProjectAddin{
    class ThreadContainer{
        StringBuilder myStream;

        public ThreadContainer(zenOn.IAlarmItem obElem)
        {
            //Get all needed Parameter from the zenon Object
            myStream = new StringBuilder(obElem.Name.ToString() +
                " " + obElem.Value.ToString() +
                " Alarm comes " +
                " " + obElem.Timecomes.ToString());
        }

        //Do something in this function
        public void zDoSomething()
        {
            System.Threading.Thread.Sleep(15000);
        }

        public void zDoSomething_Parameter() {
```

```

try{
    //This just should show that the Thread doesn't
    //block the zenon RT
    System.Threading.Thread.Sleep(5000);
    //Example: Write Alarm information into a TestFile
    string path =
        Environment.GetFolderPath(Environment.SpecialFolder.Desktop) +
        "\\MyFile.txt";
    FileStream sb = new FileStream(path, FileMode.Append);
    StreamWriter sw = new StreamWriter(sb);
    sw.WriteLine(myStream);
    sw.Close();
}
catch (Exception ex)
{
}
}
}

```

#### PROJECTADDIN

```

//procedure is executed when an Alarm comes
void zAlarm _ AlarmComes(zenOn.IAlarmItem obItem)
{
    //Create a new Instance of the class ThreadContainer with Parameter
    ThreadContainer myThreadContainer = new ThreadContainer(obItem);
    Thread myT = new Thread(myThreadContainer.zDoSomething _ Parameter);
    myT.Start();
}

```

In principle, this example can be applied to XML parsers, SQL databank connections etc. The example cited here deals only with the basic concept. Depending on the requirements, corresponding expansions are required. Performing more complex tasks, deadlocks, race conditions etc. have to be taken into account and the code needs to be adapted accordingly.

☞ *Alexander Resinger*

## .NET Windows Form Controls in zenon [PART 3]

*In the first two parts of this series, we looked at the question of how we can create an ActiveX control from a .NET control in which the zenon-specific expanded functionalities can also be used, i.e. variables can be linked etc. In doing so, we always assumed that we had the source code of the .NET control and that we could modify it. Unfortunately, this is not always the case. Sometimes it is unavoidable that we must use .NET controls without having the source code available to us.*

There are two simple approaches to a solution for this requirement: The wrapper approach and the Windows Presentation Foundation (WPF) approach. Which of these two approaches is the best in any given situation will either depend on the project requirements or on your own preference. In this issue, we unravel the wrapper approach.

### **APPROACH 1 – THE WRAPPER**

The idea behind the first approach is very simple. First, create an ActiveX control which can be inserted into a zenon screen on its “rear side” as usual. However, on the “front side” this (.NET) ActiveX control is also a “container” for .NET controls and will carry the .NET control we want to embed. Thus, what we are creating is a wrapper for .NET as ActiveX.

So, we insert the ActiveX wrapper into our zenon screen. Then, we insert our .NET control into the wrapper, which is a Windows form.

The user experiences nothing unusual in the Runtime as a result of this ‘trick’: There is no difference – in terms of appearance or user interaction – from a control that is directly embedded in zenon.

#### **Step 1:**

In the first step, we create a new project in Visual Studio 2008; the project type is “Windows Forms Control Library”. We rename the default control contained therein to “Container.cs”.

#### **Step 2:**

In order for the control to become an ActiveX control, we must first carry out the steps from the previous articles on .NET Windows form controls in zenon (*Information Unlimited Magazine* edition no. 17 and no. 18). This means: turn on “Register for COM interop” in the project properties, insert `ComVisible` and `ClassInterface` into `AssemblyInfo.cs`, insert `ProgID` etc. into `Container.cs` and finally implement the functions `RegisterClass` and `UnregisterClass`.

**Step 3:**

For the control container to be able to embed external .NET user controls, it must be expanded with the following three auxiliary functions:

```
// Dynamically creates the .Net Windows Form UserControl
public bool CreateExternalUserControl(string strAssemblyName,string strUserControlClassname)
// Sets the .Net Windows Form UserControl Property Value
public void SetExternalUserControlProperty(string strPropertyname, object obValue)
// Reads the .Net Windows Form UserControl Property Value
public object GetExternalUserControlProperty(string strPropertyname)

private UserControl m_cExternalUserControl = null;

// Creates the external .Net Windows Form UserControl
public bool CreateExternalUserControl(string strAssemblyName,string strUserControlClassname)
{
    try{
        System.Reflection.Assembly cAsm;
        cAsm = System.Reflection.Assembly.LoadFrom(strAssemblyName);
        if (cAsm == null) {
            return false;
        }
        Type cType = cAsm.GetType(strUserControlClassname);
        if (cType == null) {
            return false;
        }

        m_cExternalUserControl = (UserControl)Activator.CreateInstance(cType);
        if (m_cExternalUserControl == null) {
            return false;
        }
        // Default Init
        m_cExternalUserControl.Dock = System.Windows.Forms.DockStyle.Fill;
        m_cExternalUserControl.Location = new System.Drawing.Point(0, 0);
        m_cExternalUserControl.Name = "ExternalUserControl";
        m_cExternalUserControl.Size = new System.Drawing.Size(50, 50);
        m_cExternalUserControl.TabIndex = 1;
        m_cExternalUserControl.Text = "";

        this.Controls.Add(m_cExternalUserControl);
    }catch (Exception e) {
        System.Windows.Forms.MessageBox.Show("Create failed" + e.ToString());
        return false;
    }
    return true;
}
```

```
// Sets the .Net Windows Form UserControl Property Value
public void SetExternalUserControlProperty(string strPropertyname, object
obValue)
{
    PropertyInfo cPropertyInfo = m_cExternalUserControl.GetType().
GetProperty(strPropertyname);
    if (cPropertyInfo != null) {
        cPropertyInfo.SetValue(m_cExternalUserControl, obValue, null);
    }
}

// Reads the .Net Windows Form UserControl Property Value
public object GetExternalUserControlProperty(string strPropertyname)
{
    PropertyInfo cPropertyInfo = m_cExternalUserControl.GetType().
GetProperty(strPropertyname);
    if (cPropertyInfo != null) {
        return cPropertyInfo.GetValue(m_cExternalUserControl, null);
    }
    return null;
}
```

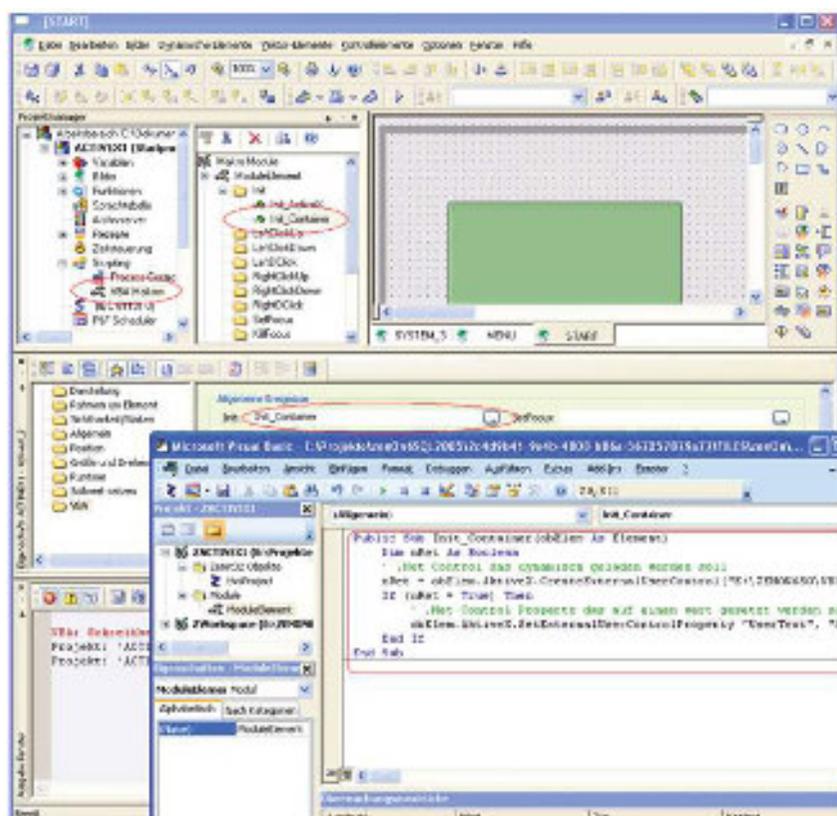
**Step 4:**

Now the control can be created and registered – as already described in part 1 (*Information Unlimited Magazine* edition no. 17). Once we’ve done this, our container can be inserted into a zenon screen as an ActiveX element.

**Step 5:**

To “fill the container with life”, a new init macro is created in the “Scripting” module under “VBA macros”. This macro can then be allocated to the ActiveX Container Control using the “VBA” “init” properties dialog.

In this macro, the .NET control to be displayed can be allocated using `obElem.ActiveX.CreateExternalUserControl` and all its external properties can be accessed via `obElem.ActiveX.SetExternalUserControlProperty` and `obElem.ActiveX.GetExternalUserControlProperty`.



```
Public Sub Init_Container(obElem As Element)
    Dim nRet As Boolean
    ' .Net Control which should be dynamically loaded
    nRet = obElem.ActiveX.CreateExternalUserControl("C:\zenDotNetControl.dll",
                                                "zenDotNetControl.SamplesControl")

    If (nRet = True) Then
        ' .Net Control Property which should be applied to value
        obElem.ActiveX.SetExternalUserControlProperty "UserText", "String Wert"
    End If
End Sub
```

To assist you with this, we have pursued this idea a little more and have programmed a ready-made container control which you can use without VBA code. This container control also provides the opportunity to select the .NET control you want to embed and its external properties by means of the properties dialog of the ActiveX element. You can find this complete wrapper in zenon versions 6.50 or later, in the ActiveX list, under the name “CD.DotNetControlContainer.Container”.

In the next – and final – article of this series, we will present an alternative option for incorporating .NET controls, which makes use of WPF. This alternative has an undeniable appeal due to the additional functionality that WPF brings with it. Don't miss it!  **Günther Haslauer**





INFORMATION UNLIMITED – WHAT’S NEXT

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In the next issue read more about ...

- The **new zenon Product Family**: Wait and see!
- **Dynamic Production Reporting** with **zenon Analyzer**
- The **COPA-DATA Partner Community** and the benefits it provides
- A playful acquaintance: **zenon and Lego Mindstorms**