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VISIONS

DO IT YOUR WAY

IN TIMES OF INSECURE
INTERNATIONAL MARKETS,
WE EXPERIENCE THE
REAL BENEFITS OF OUR
INDEPENDENCE AND CORE
PHILOSOPHY.

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IMPRINT

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GÜNTHER HASLAUER
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BERND WIMMER
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SANDRA RINGLING, INGE STEGER AND REINHARD MAYR
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WOLFGANG MOSER
presents frequently asked questions in the support team and gives concise answers.

EDITORIAL

CLOTHES MAKE THE MAN. AT ANY TIME.

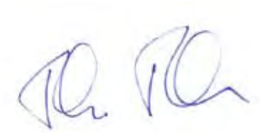
Our thought is that this proverb also applies to companies – and that, after 20 years, it is now time to think about new clothes for COPA-DATA. What started out as a small improvement of our existing attire has turned into a complete redesign over the course of the project. That is how shopping often turns out: buy new trousers and you will need a new belt, then a new shirt to go with it, then a new jacket. The old jacket may have done a good job over the last 20 years, but somehow it does not go with the new trousers anymore!

So now, everything is new: the colors, the fonts; and the big O in zenon has disappeared. We even have a new logo. Some of you may ask yourselves "why?" because people will have to get used to our new appearance and it will surely cost a lot to communicate this new image to the market. It seems like bad timing with over-sensitive stock markets and insecure businesses.

This is true; but consider that COPA-DATA has experienced significant changes over the last 20 years. Our design was no longer as modern and appropriate as it used to be. With our new appearance, we want to communicate who we are now and what we stand for now – in a way that is more appropriate to an international market, and to the future. In times of insecure international markets, we experience the real benefits of our independence and core philosophy. We do not have to focus on quarterly reports or shareholder pressure – we have the freedom to act according to the requirements and demands of our customers. And our customers benefit from that.

I hope that you, dear reader, will find our new clothes as appropriate as I do, and that you are steering towards quieter waters or that you can keep to your course, as we can.

On this note, I wish you a lot of success for the forthcoming year and some quiet time during the Christmas season.



Thomas Punzenberger, CEO

“We can only see a short distance ahead,
but we can see plenty there that needs to be done.”

ALAN MATHESON TURING *(1912 – 1954)*, British logician, mathematician and crypto-analyst

Today, Turing is seen as one the most influential theorists of early computer development and informatics. His model of computability (the Turing machine) is one of the foundations of theoretical informatics. The Turing prize – the most important award in informatics – is named after him, as well as the Turing test for the proof of artificial intelligence.

BMW Welt
Design meets technology and function

Attractive, innovative, creative – that is BMW Welt, the new pick-up center for BMW automobiles in Munich. Here, the German manufacturer presents innovative technology in a fascinating architectural background. To offer the visitor a unique experience for all senses, the building automation system must fulfill a demanding task: security, maximum availability and performance are required to control all building systems and to keep energy consumption at a minimum.

In the BMW Welt, visitors experience technology and design with all their senses; whether it is about Sheer Driving Pleasure or spaces for wonderful encounters, BMW's creativity remains unrivaled. The BMW Welt is not only a pick-up center for new cars but also a platform for showcasing the newest models and for other events. It took four years from design to the completion of the building. In 2007 the BMW World opened its gates for the audience.

OPEN AND AMBITIOUS ARCHITECTURE

The architectural concept of the BMW Welt combines design and functionality in equal parts. The eye-catcher of this construction is the 28 meter high double cone and the floating cloud roof with an area of 16,000 square meters. 4,000 tons of steel were used for building the BMW Welt. The double cone alone took about a quarter of it. A rotating stage inside the building puts every event in position. The basement offers room for exhibitions. At the interactive tables, every visitor has enough time and space to read about product and brand topics. The double cone is the ideal platform for events. On its two levels, it offers room for up to 450 people. Inside the double cone, a spiral staircase with 60 display monitors winds its way to the top. At a height of seven and a half meters, a bridge connects the gallery at the top end of the BMW Welt to the BMW Museum and to the factory premises. The open style of architecture and the glass facade allow a lot of natural light into the rooms. The elegant steel facade also contributes to the air quality of the BMW Welt. The fascinating design of this impressive exterior shell plays an important role in the building's heating and ventilation. Enveloping surfaces made of glass create a comfortable surface temperature.

LOOKING BEHIND THE SCENES

The fascinating design of the exterior is continued into the inside of the building. This creates a welcoming atmosphere and a comfortable ambience for the visitors. Rooms with lots of daylight, different perspectives and easy orientation for visitors support the presentation of the BMW brand. This task requires state-of-the-art building automation – for correctly lighting the automobiles, managing the air conditioning or the lighting system for the whole interior design.

ZENON – AT HOME IN ALL WORLDS

BMW uses the zenon HMI/SCADA solution as their building automation system. This solution by COPA-DATA is used for many applications and in many locations of the whole of the BMW group. It is used for production, administration and development – from single devices, workstations and machines, thorough to central control rooms.

It was –and is– important for the designers to give a structured overview of this large area and to stay in control of all equipment and maintenance groups. Proprietary systems isolated from each other are no longer state of the art for a technology giant like BMW. Such "standalone" applications are no longer appropriate. That is why the BMW team responsible for building automation attached great value to independence. They wanted a solution that would interact with sensors and actuators from any manufacturer. BMW uses control components by B+R (Bernecker + Rainer Industrie-Elektronik) and Siemens.

ZENON STANDS FOR AVAILABILITY, OPENNESS AND EFFICIENCY

Reliable operation requires constant availability of the system. zenon's redundant operation guarantees this. At the same time, redundancy allows for maintenance tasks during online operation. The system does not have to be shut down for this – everything stays under control at all times. This is an important contribution for minimizing maintenance costs and maximizing availability. In addition to running expenses, the low acquisition cost was another relevant decision criterion for BMW. This is where zenon's openness and capability for loading different subsystems paid off. BMW can now use the most powerful and suitable components appropriate to the task at hand.
zenon guarantees continuous handling and operation from an individual PDA and a single workstation to a complete control system. Günter Kellerer, who is responsible for facilities at the BMW Group, explains: "Besides the technical and technological advantages delivered by zenon, the highly capable cooperation with COPA-DATA is equally important to us. Service and support exceed our expectations. We receive professional service in all matters – from design and implementation to extension and maintenance."

STATE-OF-THE-ART BUILDING AUTOMATION CONTROLLING THE PERFECT PRESENTATION

In the BMW Welt, zenon serves as the central monitoring tool for all building services. Redundant server operation was of particular importance for the management team. Maximum availability and reliable operation was essential: 40 PCs are distributed across the BMW Welt for operational monitoring.

A highlight: BMW uses zenon on 60 PDAs from different manufacturers. The employees and customer advisors can use them to control all necessary switching operations while presenting and handing over cars. The system is based on a modern and secure WLAN infrastructure. It is used to connect all PDA clients with the redundant servers. For example, the customer advisor can select one of the 23 rotating platforms, modify the position of the automobiles on the platforms and adjust lighting conditions. This ensures the perfect presentation of the cars on the platforms; a special spotlight illuminates the front of the car. The daylight-based control of the window blinds is the basis for the desired lighting scenario.

Additionally, straton is used for control across maintenance groups. It establishes the connection between the rotating platforms and the lighting control system. Dynamic lighting effects are created via the DMX lighting control bus using the zenon DMX driver. The desired lighting scenes can be pre-defined in zenon. This way, each car is presented in the perfect light!

PLEASANT ROOM CONDITIONS – FOR RELAXED VISITORS

zenon also visualizes the heating system of the BMW Welt, which is controlled from 26 different substations. The substation PLCs are from B+R. They are connected with a powerful zenon direct driver that is event-triggered via TCP. zenon monitors parameters such as temperature, air pressure and humidity of all the substations and displays them in a clear and structured way. On each client, employees can make system-wide manual adjustments using the appropriate input fields. Plausibility checks avoid input errors and their consequences.

The control of the air curtain at the entrance ensures pleasant room conditions immediately after entering the BMW Welt. The various heating circuits for the under floor heating and cooling system are also visualized and controllable by zenon. Conditions in single rooms are controlled by overhead heating and cooling. The main pillars of the pillar control facade are equipped with a very efficient liquid facade heating. It ensures a pleasant environment, even at a height of 40 meters. This compensates for cold radiation from the large glass areas, and it avoids condensation. To ensure high availability and that systems are fail-safe, all monitoring information (e.g. operating hours) is recorded in zenon for maintenance planning purposes. Motors and cooling units are the focus of particular attention. The systems' quality controls are displayed with time variation curves in zenon's "Extended Trend" module; another important function is the simple optimization of control circuits.

"With this complete solution, we have met all our requirements – and even exceeded them. Reliability and availability is now guaranteed. We will be able to meet our growing requirements quickly and flexibly."
Günter Kellerer, Facility-Management, BMW Group.

A total of 70 ventilation units ensure optimum fresh-air supply. zenon gives a clear overview of all parts of the building. Employees can monitor all important values such as temperature, pressure etc. and define and change time schedules, switching sequences or the general operation mode of the systems. In the automatic mode, the desired pre-defined operation mode is selected via the zenon "Production and Facility Scheduler" (PFS). The integrated Production and Facility Scheduler is a kind of "factory calendar" that is used for the exact control of equipment and production processes depending on dates, times, events and production states.

COMPREHENSIVE VISUALIZATION, COMPREHENSIVE LOGGING

BMW also uses zenon to monitor smaller equipment such as the refrigerated display cabinets and cold rooms in the catering area to ensure the optimum temperature for food storage. zenon's Chronological Event List (CEL) documents all process messages. This list shows process relevant events and zenon system messages in a chronological order. It automatically logs every value change including a time stamp and an "old/new" value comparison.
zenon also monitors the elevators. The main purpose here is the visualization of the elevator movement for status control. zzenon also allows control over which floors can be reached. For this, zenon communicates with the S7 PLC used as the main control for the elevators in the BMW Welt. Communication is performed via TCP with the zenon direct driver.
The electricity and water meters with EIB interfaces are connected directly to zenon with the EIB driver. Meters with the M-Bus-Profibus interface are connected to the B+R DDC. This DDC transfers the current values to zenon via TCP. The meter readings are analyzed and processed with the zenon Report Generator for energy billing and internal monitoring purposes.

A GOOD EXAMPLE: ECONOMIC ENERGY USE PROTECTS THE ENVIRONMENT

Another reason for BMW to use zenon was to optimize and keep down the energy consumption in BMW Welt. For example, with the photo-voltaic system, an 8000 m² area of the roof is covered with an 800 kW photovoltaic system turning solar energy directly into electricity. By connecting this system to the corporate network, BMW contributes to the reduction of CO_2 emissions. The amount of energy recovered by the photovoltaic system is measured and logged. The zenon modules "Extended Trend" and "Production and Facility Scheduler" (PFS) allow for the optimum adjustment of all systems to environmental conditions. The "Extended Trend" module uses curves to graphically display historic and current data. This allows the automobile producer to reduce costs and act responsibly by minimizing emissions and protecting the environment.

Günter Kellerer is very satisfied with the overall result and the use of zenon: "We pay attention to accuracy and quality – also to the detail. That is what the BMW brand stands for. With this complete solution, we have met all our requirements – and even exceeded them. Security and availability is now guaranteed. We will be able to meet growing requirements quickly and flexibly." *Susanne Garhammer*

What we develop.

Everything spontaneous – really?

Sometimes it seems that the most important thing in data communication is to know what is happening. Who cares if you get information that you do not need at that moment or – even worse – you don't get it at all? If you like to work efficiently, you probably do care. And we care because we like intelligent and perfect solutions. That is why we like to prioritize when it comes to communicating values in the visualization.

"How do the holes get into cheese?" – a classic question. We will leave this question to others. Today, we look at the question "How do the values get into an HMI/ SCADA visualization?" This question might initially appear to be as obscure as the first one, and if you take a closer look you will see that the answer is not straightforward. Of course, current values must be read from the PLC somehow and then passed on to the visualization where they are processed. But how exactly does that work? Which values do we need for a start?

As we all know, in the beginning, there was polling. In its simplest form, this meant that one after the other all variables were read from the PLC synchronously. This method is still used in very simple visualization today. As we have already looked at the topic of block-reading in an earlier IU issue, let us remember an important drawback of that method: that is, it reads many variables that are not needed. This brings us right to the core principle of spontaneous data traffic, which is also called "event operation".

At the first glance, these topics may seem to be completely unrelated. If we take a more detailed look at how classic spontaneous data communication works, we immediately get the point. The basis of every spontaneous communication is a mechanism that allows the data receiver to tell the data sender exactly what is to be sent spontaneously.

ASYNCHRONOUS = HIGH PERFORMANCE

Because zenon is an open system that gives you complete independence when connecting to control systems, we were able to choose the best option (from our point of view): data exchange at the protocol abstraction layer. Otherwise, we would have wasted the potential advantage of native communication with intelligent PLCs, many of which support spontaneous data traffic. That is why the internal concept of the zenon Runtime is completely spontaneous by design – right down to the protocol drivers. Only at driver level, and only if the PC solely uses polling, will zenon map to this slow and resource-consuming method.

What does this mean in detail? The core principle is a mechanism for registering and deregistering variables that are either currently needed or no longer needed. As soon as the value is available or changes, the communication partner (=publisher) will send the current value to the value requester (=subscriber). However, this is done asynchronously, i.e. at a later time. This is the main difference to the polling method. In the meantime, the subscriber can, and should, because of performance reasons, take over other tasks.

This asynchronous value processing method is a peculiarity that needs to be considered by all zenon modules, as well as external programs and VBA macros, in order to ensure optimum performance and get the maximum from this principle.

We refer to the act of registering variables as "Advise". This Advise action can include a list of variables that will be read from the PLC from that time onwards – in whatever way. The value dispatcher will then asynchronously execute a so-called change event for every variable value, including the current value, its status and a time stamp. If the variable values are no longer required, they will be deregistered with an "Unadvise" action.

For Example:

The operator opens the picture SYSTEM1, which displays the following variables:

Outdoor temperature, power consumption, alarm status, counter

a) When opening the picture, a new read list (=connection) is created and the variables Outdoor temperature, power consumption, alarm status, counter are inserted
b) After that, ADVISE is executed for the connection.

The operator closes the picture

a) UNADVISE is executed for the connection.
b) The connection is deleted.

We can clearly see that, while the picture is opened, program code will only be executed when variable values change. In all other cases, the picture will stay as it is without causing any CPU loading. Nevertheless, you can be sure that every value will be processed and none of them will be lost, even for fast changing values. This might not be important for some pictures, but for other modules such as alarming or archiving, it is vital. However, we also see that there are no synchronous calls or wait loops. This means that the program execution will not be interrupted, even if the PLC is offline or if the read action takes several seconds (for instance, if it is performed via a modem connection). The values will appear in the picture as soon as they are available. After all, it would not make sense to display none of the variables for 10 seconds just because two of them could not be read.

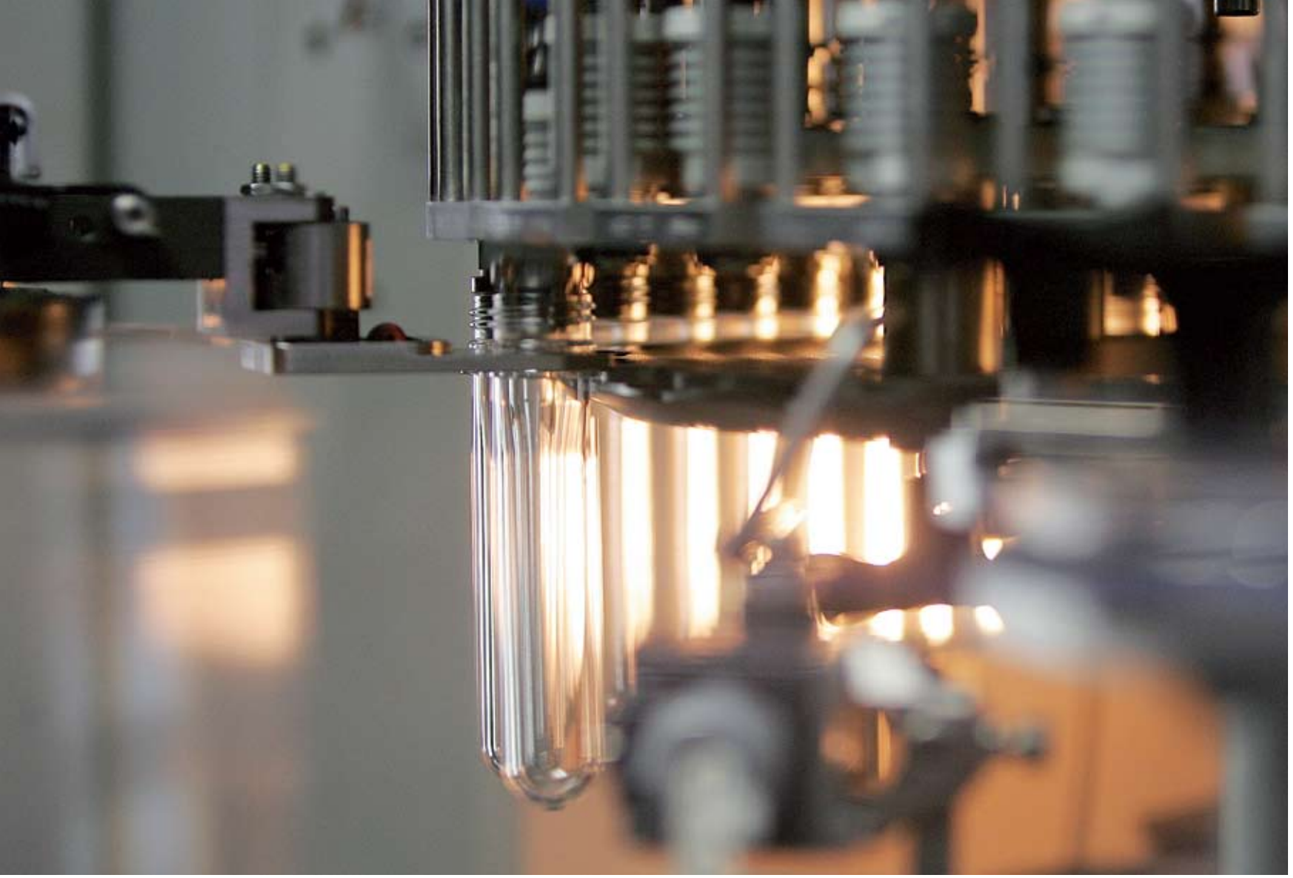
...AND VBA?

best advantage of this is that the engineer does not have to worry about a thing – because zenon does all of the above automatically. The only point of contact with this asynchronous concept of spontaneous data communication is VBA. Of course, VBA macros and external programs must also follow the rules of asynchrony. Otherwise, all the advantages mentioned above would be lost. The process is the same, as described for the picture previously.

In VBA, the connection is called "OnlineVariable", the Advise is called "Define", the Unadvise is called "Undefine" and the change event is called "Change-Event".

In order to get variable values from the PLC, you have to create a new OnlineVariable, add all required variables with Add and then execute Define. After that, you will be notified asynchronously about every new value via an event. If you no longer require any values, you can deregister the variables using Undefine and destroy the OnlineVariable.

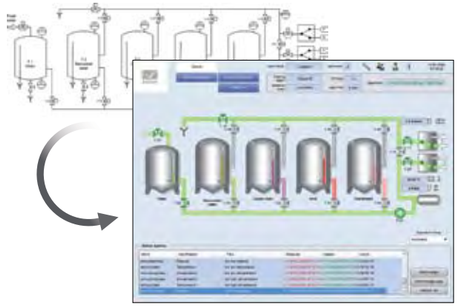
Quite simple! command you should not use is waiting for values in wait loops. After all, the pictures also want to get some CPU time, and the change event will come automatically anyway. Polling and synchronous reading is a thing of the past! Today, we make use of the "time in between". It is quite easy to create high-performance resource-saving projects and write VBA macros when everything is spontaneous, isn't it? *Günther Haslauer*



Effective industrial hygiene with zenon

A personal view from Emilian Axinia, COPA-DATA Food & Beverage automation specialist.

Are you involved in the automation of F&B plants? Are you responsible for industrial processes that have to be well controlled and have to deliver the expected performance? Is the hygiene of the processing equipment a priority for you? Do you build CIP systems? If so, read on to see how zenon could make your life easier...



WHAT IS CIP?

CIP – Cleaning-In-Place is a familiar process in the F&B industry. Everybody speaks about it, no matter if the main task is beer production, milk processing, syrup mixing or any other food product. In each case, perfect cleaning of the equipment is a must. Not only because regulations requireit, or for food hygiene, but because the taste of product will be affected if it contains traces from previous batches or microbes above the set limits.

The food or the drink is prepared using tanks, pipes and other equipment that are very often large and combined in complicated installations. How are they to be cleaned quickly and thoroughly?

A long time ago the cleaning was done manually. Just imagine people dissembling the equipment part by part and then washing every part with brushes, soap and water, then reassembling. A big effort, much soap, much time and unsure results!

That is why it was a big step forward to clean the equipment and its parts "in situ", as though in normal operation. So, we speak about "cleaning in place" (CIP). There are specially designed systems for doing this task, called CIP systems. Remember the steps that are required when you want to clean something: you firstly rinse the part, then you apply a cleaning chemical solution and then you rinse again. Eventually, you disinfect the whole item just to be sure that no microbes or other traces remain. Well, a CIP system manages similar steps. Usually, it keeps the water and the cleaning chemical solutions in tanks, because it is efficient and economic to recover as much of these materials as possible. Using one or more pumps, and ensuring the right temperature and speed, the fluids are sequentially circulated through the chosen tanks or pipes for predefined periods. Inside the tanks, the view of the cleaning process is spectacular because of the "water games" created for thorough cleaning purposes by embedded spraying balls. The principle of cleaning in place is very useful and, apparently, simple, but without the right control of each detail the results can be very limited.

WHY CONTROL CIP AUTOMATICALLY?

I propose now to draw your attention to several reasons why automation is so important for CIP systems. These reasons have been inspired by some of the standard features within zenon. This is because zenon makes industrial hygiene management more effective...

As we mentioned before, a CIP system is used to clean many tanks, pipes and other parts which are in contact with the food product. Every such object needs an adequate cleaning procedure in order to reach the best results with minimum consumption of energy, water and cleaning fluid. Depending on what is to be cleaned, the CIP system has to adapt perfectly and execute the right steps with the right parameters. This is not easy to do manually... but zenon makes things easier for you because of its advanced Recipe Management. I invite you to read more about this on our website, in our catalogue, or in the help function within zenon. The authorized user can conveniently configure the duration of each step, the temperature needed for every solution, the concentration of the cleaning solution and many other parameters. In this way you prepare for the smooth and correct execution of CIP tasks.

The quality of the CIP process is absolutely vital in order to guarantee the quality of the final product. The same cleaning procedure has to deliver the same level of hygiene at every execution. The entire system is designed to deliver to this requirement, but is it always achieved? Incorrect behavior of the temperature regulator or an underperforming pump can cause an unwanted situation; e.g. after the cleaning procedure, some dirt remains in a pipe where a new batch of food will flow. The consequences are difficult to anticipate, but frequently the contaminated food is good only to be scrapped, with consequential environmental and other disposal costs...

zenon checks the process online and alarms the operator before it is too late! The cleaning parameters are monitored at each step, and an alarm is produced if something goes wrong. zenon monitors in detail to ensure the CIP control reaches set targets. Problems are easily drawn to the users attention, thanks to the zenon embedded functionalities of Alarm Management and Extended Trends. zenon does even more: at the end of the cleaning, it sends confirmation as to whether the entire cleaning process exactly followed the settings. If the settings weren't followed for any reason, the operator can decide to repeat the cleaning. This is better than risking contamination of the food next in line for production.

Those responsible for industrial hygiene will want to know how previous CIP processes ran. Traceability is getting more and more important; the producer has to be able to find all details of the production history, including the critical cleaning processes. zenon makes this level of reporting possible because it archives all the required data.

Based on the archived data, zenon produces reports presented from filtered and processed information, for fast and clear analysis. For instance, the maintenance staff of the CIP system can find out if the automatic valves are operating well. Through wear or from control errors,

it can happen that the acid and the alkaline cleaning chemicals produce a completely unwanted reaction. Thanks to zenon, such situations and their costly consequences can be detected and prevented.

As I said, automation – and particularly zenon – makes your life easier, because zenon takes it takes you on an easy path to high performance:

- Your CIP system is under control and runs smoothly, maintaining the targeted hygiene level
- The plant staff operates the CIP easy and safely, knowing every moment what is happening, for quick and timely decisions
- Based on the statistics zenon delivers, you can optimize the consumption of energy, water, heating agents and cleaning chemicals.
- zenon documents the details what happens in the CIP system for later analysis, including the calculation of the relevant key indicators
- The CIP-related information is easily available to the right people by Intranet or Internet connection

ZENON – STATE-OF-ART INTEGRATION OF AUTOMATIC CIP SYSTEMS

Together we just took a short look at the advantages of automating CIP systems with zenon. Once an automated CIP system is running these advantages are clear; but what about the task of improving the automation of the existing CIP systems? How easy is it to integrate new automatic CIP systems? Personally, I am an enthusiast of the solution based on zenon and straton, and I will now explain why!

ZENON & STRATON ALLOW YOU TO CHOOSE...

You need to automate a CIP system with many requirements on the process safety side? Or your CIP needs a cost-effective automation solution? You need to run your application on different hardware platforms and in different configurations, but you also want to reduce development time? For these requirements, and many others, take the opportunity to experience the freedom of choice provided by the powerful integrated solution of zenon with straton.
As you may know, straton is a Soft-PLC which is included with zenon, and programmed according to IEC 61131-3 standard. Simply stated, straton allows you to integrate the procedure and the steps of your CIP systems. In the same easy way, you can develop and maintain control loops and simulation scenarios. In your HMI/SCADA application with zenon you integrate the user interface, the recipe management, the alarm management, the trends and the other things you need for an advanced CIP automation. Because of the tight integration of straton with zenon; the data, both "read & write", within straton can be made available with one click to zenon.

Now, a beautiful thing happens: once you have developed the software for your aapplication, using the control part in straton and the HMI/SCADA part in zenon, you are free to choose where you place and run this intelligence. You can use just one PC to run all of it or you can decide to distribute these parts to various hardware components linked in a network.

In other words, you protect your time investment in developing the application; if you change the hardware, it doesn´t mean that you have to lose time by rewriting the software. You are truly hardware-independent!
You can develop the complete project, hardware and software, which will bring maximum benefits to your application; then, you place straton and zenon exactly where you need them, using networking technology. If, additionally, you need a highly reliable system, this is easily achieved because both zenon and straton are designed to work in a redundant manner with configuration by a single mouse click. If you have more than one CIP system, you can network their automation for operating or for analyzing purposes. Your CIP system is accessible even over Internet, if required, owing to the WEB-server technology of zenon.
Once again, zenon makes it easy to increase the functionality or to optimize the automation costs of your CIP systems.

THE "MAGIC WAND" OF ZENON AUTOMATIC ENGINEERING

Let´s do an imaginary exercise together: you automate your CIP systems one by one, so you always need to build the software for both process control and HMI/SCADA. But the CIP systems differ: sometimes with more tanks, sometimes with less; sometimes with only one cleaning circuit, sometimes with more; and, obviously, other things could be different from one system to another. Then you have to answer some questions, in order to describe your CIP systems, such as: how many tanks for the storage of the cleaning solution? You take just minutes to complete the electronic questionnaire and then you give one more click: your PC already starts to build the control logic and your HMI/SCADA application; soon you find that the automation software is ready, amazingly adapted to the needs of your CIP project...

I am really happy to tell you that in zenon this is a reality! The description was the way that the zenon Wizards work! In zenon, Automatic Engineering allows you to build the high level language with minimum effort: you enter information about your CIP system and about your cleaning processes and zenon does the engineering for you!

I also like another example of applying the Automatic Engineering in zenon very much. First, you can build your straton-based PLC program – adapted to particular process equipment, containing all the required information for controlling valves and pumps and for measuring process values. A zenon Wizard can do the amazing task of reading the PLC program and to automatically build a large part of your HMI/SCADA application. You may need just one additional step, for instance the fine tuning of the PID scheme which is the part of the SCADA user interface.
I invite you to learn more about the Automatic Engineering in zenon – simply because you can save much time during your integration work!

Well, we have arrived at the end of this article. The fact which gives me most satisfaction is that providing easy access for users to high technology was a fundamental concept of zenon from the beginning. And it has been wonderful to highlight here some of what zenon can bring to the Food and Beverage industry: CIP made more effective and efficient with zenon. If this article was interesting for you, I would be glad to receive your opinions and questions by e-mail: EmilianA@copadata.com

Emilian Axinia

tesa AG – Successful self-adhesive system solutions

zenon is an all-round solution for every requirement

Fast, individual, networked – zenon is used in different sectors at tesa. The visualization and automation software delivers power to the energy supply as well as coating and packaging departments.

tesa AG is one of the leading producers of self-adhesive product and system solutions for industrial, commercial and private customers. Business customers include the automobile industry, automobile suppliers, the electronical industry and the furniture industry. 125 years of experience in coating technology and the development of adhesives and innovative product solutions have taken the Hamburg based company to the top of the world market in many application areas. More than 6.500 products developed and produced by tesa are sold in over 100 countries. With about 3.800 employees, the company generates an annual sales volume of about 800 million Euros. While the brand awareness of tesa in Germany is at about 98 percent, more than three quarters of its total sales volume are achieved with system solutions for industrial customers. Just under a quarter of the sales volume is accounted for by products for private customers that are designed for everyday use in offices, houses and gardens.

SUCCESS BASED ON INNOVATION

Besides the quality of the products, another reason for the company's success is its high innovation rate, which was at 48 percent in 2007. This value refers to the part of the sales volume achieved with newly developed products, measured within a time span of five years. An important part of the tesa products is produced in Offenburg. With 480 employees, it is the biggest tesa production location worldwide and specializes on the production of one-sided adhesive tapes. 250 million square meters of adhesive tape is produced there every year. The plant is equipped with the most innovative technologies worldwide, including the special solvent-free production process developed by tesa.

ZENON – SIMPLE NETWORKING AND INTEGRATION

Before zenon, tesa was using different software systems on each of the control stations in the plant in Offenburg. Now, they use one software package for controlling and monitoring the energy supply and production equipment. The experts at tesa examined all relevant solutions on the market in an extensive market analysis in 2007. zenon is now used as the automation solution whenever new equipment is added or existing equipment is upgraded. There were many reasons for this new solution: zenon is flexible and can be used on many different hardware platforms – from a Windows CE device to a normal PC.

Sebastian Balz, project engineer at tesa in Offenburg, is responsible for developing new equipment and modifying existing equipment at tesa. He explains: "The most important for selecting zenon were its simple networking functionality and the continuous implementation of the visualization system. This allows us to create and reuse projects. The ability to scale one and the same project all the way from a machine-oriented application to a control system raises the efficiency of everyday work and reduces errors."

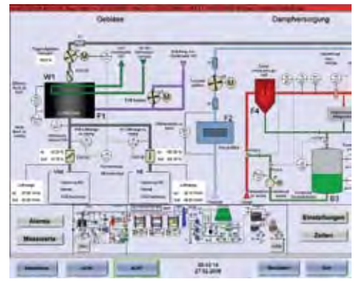
USER-FRIENDLINESS AND COMPREHENSIVE OVERVIEW

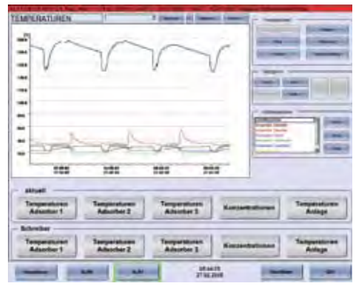
Installations equipped with zenon include the boiler house as well as the coating and packaging systems. In the coating unit, the adhesive agent consisting of rubber or resin with certain additives is applied to the impregnated and pre-painted base paper. In the future, tesa is going to aggregate all relevant information for the shift supervisor at the end of a shift, in order to document and reproduce processes like the development of adhesive forces. In the packaging unit, the products are then cut, packed and put on pallets. The so-called boiler house is responsible for energy supply and recovery. Equipment for steam generation, the gas burners and the central heating system can be found here. Sebastian Balz and his colleagues took special care to ensure that all operation and control actions are well-structured and easy to perform without much training effort. Today, zenon displays the complete system at the bottom of the screen via the picture function worldview. The user can zoom in on parts of the system, which are then displayed in the main window of the screen. This way, he can always keep the complete overview and at the same time watch and operate parts of the system in detail. If there are any changes to the equipment, you can update them quickly in zenon. In addition, you can reload changes to the project in zenon during runtime. With zenon's multi-monitor management, tesa offers its operators even more convenience at work. Thanks to this splitting functionality, employees sitting in front of screens for many hours can use a larger screen area and spend less time using submenus. Sebastian Balz reports: "We want to offer our colleagues the technical support to make their work more convenient and efficient. Simplicity, overview, stability and speed are the most important factors for the users' acceptance of a solution." Another advantage of zenon: No complex programming skills are required; employees only have to parameterize. This makes work easier, especially for maintenance staff, who are usually not very familiar with the employed software.

zenon records all the performance data occurring during operation extensively and in detail. The data is stored in a database. The recorded performance data is then displayed in charts and diagrams. Balz: "This function is essential for us because we have a full-time operation seven days a week. Whenever there is a malfunction, we immediately want to know about the causes and the extent of the problem." Data archived by zenon can also be compiled for a trend analysis according to the requirements of the user. Besides the classic operation and monitoring tasks, zenon also handles the central user administration at tesa.

THINK PROFESSIONALLY, ACT RESPONSIBLY

Besides its user-friendliness, the sustainability of a solution is also important for tesa. Thanks to zenon's backward and forward compatibility and its runtime online compatibility, all investments are protected in the long term. Scalability and continuity are additional and well-known advantages of zenon. Sebastian Balz seems very satisfied with the new solution for energy supply and production: "The guiding principle of our company is: ´Experiencing innovations, developing solutions, creating the future´ . We stick to this principle and that is why we also use internal solutions that are innovative and efficient and that make work easier and more convenient for our employees. zenon enables us to do that." *Frank Hägele*





"... I was sitting in the rooms of the Analytical Society, at Cambridge, my head leaning forward on the table in a kind of dreamy mood, with a table of logarithms lying open before me. Another member, coming into the room, and seeing me half asleep, called out, "Well, Babbage, what are you dreaming about?" to which I replied "I am thinking that all these tables (pointing to the logarithms) might be calculated by machinery."

CHARLES BABBAGE *(1791–1871)*, mathematician, philosopher, inventor and economist

Babbage developed the "difference engine" and the "analytical engine" – two mechanical computing machines. The analytical engine is today seen as the predecessor of the modern computer. The reason for the development of computing machines was for example the low reliability of numerical tables for calculating mathematical functions that were used for navigation. Frequent errors were made during their calculation. Charles Babbage tackled this problem with the methods of industrialization: Dividing the work into single steps (algorithmization) and assigning these steps to machines (automation).

New zenon focus in Switzerland

Switzerland is an interesting market for many strong companies, because quality is valued here. Perfect terrain for zenon. Frank Hägele, sales manager at COPA-DATA Germany, is responsible for marketing zenon in Switzerland. Together with the distributor Satomec, he supports the local operative's business and develops new business strategies.

Frank Hägele has a lot of experience in marketing zenon in the sales area of Southern Germany. Now he will increase the sales in Switzerland. The Swiss distributor Satomec, which specializes in PLCs, HMIs, SCADA, network technology and switchgear, will be an important partner.

Switzerland is the home of many leading pharmaceutical producers, an industry in which zenon keeps on proving its strengths. The German suppliers of these pharmaceutical producers profit from a process control system that meets all necessary standards and specifications with a single mouse click. Frank Hägele will also keep an eye on the big players in the Swiss food & beverage industry... Frank Hägele explains: "While we are getting established in this area, it is really important to concentrate on high profit customers." Besides that, existing partnerships will also be strengthened. In the textile industry, for example, Benninger Zell triggers important innovations in machinery construction and the process industry.

Our strategy will be supported by establishing a new COPA-DATA subsidiary in the area of Basel / Freiburg / Bodensee. Frank Hägele: "We look forward to improving our business relations with existing partners and to acquiring new customers in Switzerland. The Swiss market offers many opportunities of getting more involved in our target markets - pharmaceuticals and food." *iu*

Successful start: COPA-DATA USA

COPA-DATA is expanding into many countries on different continents. In May 2007, COPA-DATA Corp. was launched in the USA. Matt Udovic is the Director of Operations and leads our team in probably the most challenging market. Matt is well-prepared for that.

For many years, Matt Udovic worked for a company that produces industrial components such as IPCs and terminals in the USA. Based in Livingston, New Jersey – not far away from New York – COPA-DATA Corp. is responsible of the complete North American market including USA, Canada and Mexico.
First goal: increasing the market share of COPA-DATA in North America, acquiring strategic customers and building up a network of loyal, high-quality system partners.

The first few steps have already been crowned with success. In the automotive sector, COPA-DATA USA has already won some important suppliers such as Dürr US, ABB Inc. and A&E Engineering as customers.

The food & beverage industry is also turning into an important second foothold. Our strong relations to machine and equipment providers such as Krones, Sidel, KHS or Sigpack Systems proved to be really useful in this. In the pharmaceutical industry, COPA-DATA USA can also be proud of establishing relations with some well-known global players.

These first encouraging successes are the basis for long-term strategic market cultivation. So now, we need to hoist the flags, arouse the interest of customers and convince them of our products - and win committed employees for sales, support and administration. COPA-DATA USA is on its way! *iu*

COPA-DATA UK Ltd

Set in the heart of Cheshire in the North West of England is COPA-DATA's latest subsidiary company, COPA-DATA UK Ltd. Established just over one year ago as part of the international expansion plan to grow local presence and support; COPA-DATA's strengths are fully deployed in this growing business.

Duncan Fletcher
Managing Director
COPA-DATA UK

The offices in the town of Sandbach enjoy views over a country canal, the Trent & Mersey, which is part of the "Cheshire Ring" – the communications highway of the future back in 1750.

This would be ideal if there was any time to enjoy the view as the company is dedicated to growth, so it is a case of a quick look at the countryside on the way in, and much later on the way home. Managing Director, Duncan Fletcher, in keeping with the nautical theme, is 'at the helm' but spends much time elsewhere with customers and prospective customers.

Duncan, who has many years of experience in the industry, has received a welcome from many companies with his 'Keep it Simple' and latterly 'do it your way' presentations and discussions about COPA-DATA, zenon and straton. The United Kingdom and Ireland are mature SCADA markets but the COPA-DATA message is received well and is increasingly seen as a "better way" – this is more than the product – it is the whole company ethos. Duncan has set high standards for all of the company's activities; "doing it right" to build the image and the reality of a quality, capable and responsible supplier.

COPA-DATA UK Ltd has an aggressive growth plan which is supported by a whole range of marketing initiatives– including an active dialogue with the editors of key industrial journals and other opinion influencers. The business has already outgrown its offices and is extending the space it occupies within its current location by over 100% in the current year. This will allow improved facilities and larger training courses to be held on site, fully exploiting the excellent location. So, while the narrow boats on the canal slowly pass by outside, there is a flurry of activity inside that is about the best of today's technology and that which will make the future. *iu*

COPA-DATA: Educate your own professionals!

Job advertisements show that the IT market needs young, well-educated professionals with a lot of experience who can speak several languages and who are flexible and productive. Of course, COPA-DATA is keen to employ such experts, but if you want to build a really strong team, you need many different talents that complement each other. That is why COPA-DATA takes different approaches to finding new employees.

Targeted searching via job advertisements is one of the most common ways and also used by COPA-DATA – but it is not the only approach and often it is not the most effective. Many development and support experts find their way to Salzburg via websites and forums or via one of our subsidiaries. One of the most important things is to be proactive – not as the applicant but as a company.

COPA-DATA has been a committed partner of universities of applied sciences and vocational schools for many years. Partnership activities range from the practical support for the IT infrastructure of schools to internships on cooperative projects. Junior engineers and business economists get to know the company, they have the chance to share their ideas and to get in touch with the COPA-DATA spirit. A good foundation for a start to an interesting job!

COPA-DATA goes one step further and has an apprentice scheme. We do not wait for ready-made professionals; we encourage and mentor young people on the way to their dream job.

Of course, a good education is only the basis for a good start - especially in the IT industry. As soon as you are in the swing of daily work, continuing education is important – on your own and in your company.

Read all about the methods COPA-DATA uses for finding new employees and training existing ones, about exciting projects in cooperation with technical colleges and about the road that some employees have travelled from various countries to get to Salzburg, Munich or other subsidiaries – in this issue and future issues of Information Unlimited. Today, we will talk about the apprentices here at COPA-DATA in Salzburg and our cooperation with the Salzburg University of Applied Sciences.

APPRENTICES AT COPA-DATA SALZBURG

If you want dedicated and skilled employees, you must take care of them from the very start. In addition to finding experts, COPA-DATA Austria is dedicated to educating young people. In spring 2008, two apprentices started their careers in Salzburg.

Lydia Eingang and Konstantin Ferner started in May this year. They had quickly convinced us, both during the job interview and in the trial day that they were the right choice. Inge Steger, who is responsible for apprentices, explains, “During the interview and the tests, we can find out whether somebody will fit into our company. Additionally, we always invite our short list for a trial day. We assign tasks from everyday work to them as if they were already working here. They get the chance to find out if they would like to work here, and we can check who would be the best addition to our teams.”

Once they have received their early experience, in the following months they will get to know all parts of the company. Inge Steger, “We educate our apprentices according to their individual talents to teach them many different skills. They will also get the chance to focus on things they are interested in.”

COPA-DATA Germany provides apprenticeship positions: A chance for job starters.

Committed, friendly and skilled – our two apprentices, Gülcin Sahin and Cathrin Spreider

Education is one of the highest goals of a society – nevertheless it is somewhat neglected in Germany. By the end of last year, over 500,000 young people were looking for an apprenticeship position through the German employment office. The actual number seeking positions was even higher. Elisabeth Attanasio, Manager Account and Personnel at COPA-DATA, explains, “That was a good enough reason for us to give a chance to young people who were looking for a job.”

CREATING PERMANENT JOBS

Sandra Ringling, Assistant Sales & Marketing at COPA-DATA trained as a trainer during a ten week course at the Chamber of Commerce and Industry. In cooperation with Elisabeth Attanasio, she looks after the apprentices during their apprenticeship. Sandra Ringling explains, “Continuous education for all employees is an important goal here at COPA-DATA. As a logical consequence, we want to give a chance to young people who are looking for a job, paving the way for future skilled employees who feel a strong connection to our company – that must be our goal.” Via job advertisements, the employment office and advertisements on school noticeboards, we quickly found appropriate candidates. After finishing their apprenticeship, these two employees will receive a permanent position in the Sales & Marketing department and the Accounting & Personnel department at COPA-DATA.

PERSUADED BY COMMITMENT

Four candidates reached the final round. Sandra Ringling and Elisabeth Attanasio paid attention not only to the grades and the professional qualification of the candidates, but also to their appearance and presentation. They were looking for communicative, committed and authentic employees. In the end, the decision in favour of Cathrin Spreider and Gülcin Sahin came naturally. Both candidates were well prepared and gave persuading presentations. The young colleagues also passed the tests with flying colors. In September last year, they started their apprenticeships as office communication assistants.

ESTABLISHING A CONFIDENT RELATIONSHIP

Sandra Ringling has introduced an open day for parents of new colleagues, so that they can get to know the whole COPA-DATA team and establish a confident relationship with their child’s new employer. After a short presentation of the company and its products and services, the parents of the apprentices were taken on a company tour to get to know the whole team of COPA-DATA Germany and to see what their children were working on.

What do the new apprentices think of their new job at COPA-DATA? “I really like the working atmosphere here. Every day, I look forward to working together with my nice colleagues. During my job interview, I already received the impression that the employees are very open and warm-hearted. This impression proves to be true every day,” Gülcin Sahin reports. Cathrin Spreider thinks that she could stay at COPA-DATA for many years to come: “I have a very interesting and diverse job here. Working with the computer is as exciting as the frequent interaction with customers.” *iu*

Who‘s who?

KONSTANTIN FERNER

Name: Konstantin Ferner **Function at COPA-DATA:** I started my apprenticeship in information technology/computer science on May 2nd, 2008. I am very glad that I am an apprentice at COPA-DATA. I want to finish my apprenticeship well – and then educate myself further to get a place at the University of Applied Sciences. **Born:** August 12, 1992 in Oberndorf. **What happened before COPA-DATA:** Secondary general school in Michaelbeuern and one year of polytechnic school in Oberndorf. **Hobbies:** Skateboarding, snowboarding, listening to music, meeting friends. **Favorite film:** Die fetten Jahre sind vorbei. **Music:** Rock, Punk, Reggae.

Email: KonstantinF@copadata.com

LYDIA EINGANG

Name: Lydia Eingang **Function at COPA-DATA:** I started my apprenticeship at COPA-DATA Salzburg in April 2008. **Born:** May 30, 1992 in Oberndorf.**What happened before COPA-DATA:** After my 9th school year, I decided to become an apprentice, but I soon found out that my first apprenticeship position did not suit me at all. So I started looking for a different position and was very lucky to find one at COPA-DATA. **Hobbies:** Horseback riding, shopping, swimming, listening to music, etc. **Music:** Rock, Pop ... depends on my mood.

Email: LydiaE@copadata.com

CHRISTOPH WELSCH

Name: Christoph Welsch **Function at COPA-DATA: S**ales Engineer, working in Sales Austria since May 1, 2008. **Born:** Saw the light of day on May 27, 1980 in Schwabing (Munich), but soon moved to Saudi Arabia for 2 years. After 5 more years in Bavaria, moved to Kuchl in Austria. **What happened before COPA-DATA:** After finishing the commercial school in Hallein, I worked for NÜRNBERGER Insurance for some time. After that, I did my social service in the IT department of the hospital in Hallein. But life does not stand still and I needed to change something in my life, so I started working at H&B-Fertigungstechnik, where I worked in logistics and IT. After the metal industry, I moved to WIBERG, where I had a spicy time in the IT department for 7.5 years. **Hobbies:** The most important event in my life happened on March 12, 2006: My son Noah was born in Hallein. Since then, I have been a very happy and proud father. Besides this challenging task of being a father, I sometimes find the time for mountain biking, jogging and cooking – and, as my son likes it so much, I also sometimes ride a unicycle.

Email: ChristophW@copadata.at

RALF FLEISCHMANN

Name: Ralf Fleischmann **Function at COPA-DATA:** Working in the Support team in Ottobrun since September 2007. Started as an intern; part of the team since March 2008. **Responsibilities at COPA-DATA:** Customer service regarding all technical questions about zenon. **Born:** July 23, 1977 in Kulmbach. **What happened before COPA-DATA:** During my course of studies as an Industrial Engineer I learned about the basics of automation technology. To further expand these skills, I decided to work as an intern at COPA-DATA. Prior to that I looked after the computer system in my parents’ textile company. **Hobbies:** Sport – currently inline skating, swimming, running, skiing and playing tennis at COPA-DATA. I also enjoy reading a good book. **Favorite books:** Currently, I am reading a book by the Japanese author Murakami called “The Wind-Up Bird Chronicle”. **Music:** I generally like to listen to all kinds of music. But Rock is my favorite. **My motto:** There is no problem that can’t be solved.

Email: Ralf.Fleischmann@copadata.de

KRISTINA KORBELY

Name: Kristina Korbely **Function at COPA-DATA:** Sales Engineer **Responsibilities at COPA-DATA:** Since September 1, 2007, I have been working as a Sales Engineer for COPA-DATA Germany. In the office, I take care of our customers in Southern Germany and I also support my sales colleagues in the field. **What happened before COPA-DATA:** Before I joined COPA-DATA, I trained in IT systems sales at Deutsche Telekom. After finishing my training I decided to stay there. My tasks included giving technical and commercial advice to residential customers and small companies about telecommunication devices and charge rates. I was involved to a wide spectrum of tasks, ranging from simple router configurations to the company-wide installation of telephone and intercom systems. **Hobbies:** cycling, travelling, swimming. **My motto:** Life is worthless if you don’t know what you’re living for.

Email: Kristina.Korbely@copadata.de

GERD KLIER

Name: Gerd Klier **Responsibilities at COPA-DATA:** Sales Engineer, working in the Sales office at COPA-DATA Salzburg since May 2008. **Born:** March 21, 1980 in Linz. **What happened before COPA-DATA:** After secondary school, I started as a technical employee at Ascom. As the production job was not challenging enough for me, I attended a multimedia course in addition to my job at Ascom. I developed an appetite for this and so after the course I decided to move to Vienna. I received my Bachelor of Arts in digital film production at the SAE in late 2004 (in cooperation with Middlesex University of London). While I was studying in Vienna, I started working as a freelancer, then worked for Hutchison 3G Austria for one year and then started working as a technical employee at Vicos, my father’s company. This temporary solution turned out to be the starting point for my employment at COPA-DATA, where I can now take the opportunity of Sales.**Hobbies:** Skiing and snowboarding in winter, riding the motor bike or lying in the sun at the lake in summer. Most of the time, you will see me playing ball games such as volleyball or basketball.

Email: GerdK@copadata.at

MARKUS PAROTAT

Name: Markus Parotat **Function at COPA-DATA:** Test engineer in sales and application support **Responsibilities at COPA-DATA:** Technical service for customers and system partners. **Born:** January 16, 1980 in Remscheid. **What happened before COPA-DATA:** In 1997, I finished my training as a power electronics technician for automation technology. After that, I worked as a service technician at Schindler, gaining further experience with elevator technology. In 2006, I finished my training as a certified technician for automation technology. Before joining COPA-DATA, I worked as a service technician in commissioning for KHS Metec. My tasks included worldwide assignments as a technician in the food and beverage industry. I obtained further experience with fill management systems, image processing systems and the analysis of prototypes. At COPA-DATA, I am now in training to become a certified Visual Basic programmer. **Hobbies:** Model railways, bowling **Music:** Everything except classical music. **My motto:** If you really want it, you can do it.

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Who‘s who?

“It is only with the heart that one can see rightly,”

MAGDALENA WALLNER. *16th of July 2008, Bad Reichenhall*

JANNE RESCH. *13th of July 2008, Zell am See*

said Antoine de Saint-Exupery. And he continues, “What is essential is invisible to the eye.” Children are perfect at seeing with their hearts. We project so many chances and hopes on children – so many dreams they are supposed to fulfill. We should let them find and live their own visions. Let us join them in wondering about the little day to day wonders and let us learn to see the world with their hearts again. Maybe then our dreams will start to grow again and maybe even come true.

ERIC JOHANN MOSER. *5th of October 2008, Salzburg*

HELENA ROSA GASSER. *23th of May 2008, Salzburg*

ANNA OBERAUER. *23th of Feburary 2008, Salzburg*

Interface to SAP applications is the talk of the day.

This year COPA-DATA again demonstrated its leading position in the HMI/SCADA world. Under the motto “do it your way!”, the company presented the new zenon® 6.22 and surprised the audience with a direct connection to the SAP world.

Customers, prospects and partners crowded together at the fair booth and discussed the advantages of the latest zenon version for current and upcoming projects. There and then, the fair visitors were able to check out the wide range of applications of the HMI/SCADA system zenon and its partner, the integrated IEC61131-3 programming system straton®. Particular attention was paid to the new interface to SAP R/3 enterprise software, which has been certified by SAP. It provides an optimized data flow between production planning and production processes. The important thing about it is that zenon now “understands SAP”. Measured values, counter readings and alarm messages are transmitted directly from the process to the SAP system; recipes from the SAP application are put into immediate effect by zenon and straton. With this, COPA-DATA has created a direct connection between the process level and the ERP level. The visitors at the fair booth were convinced that this will eliminate sources of error and avoid unnecessary investments. Beside the certified interface to SAP® applications, the integrated straton solution was also much appreciated. Visitors also showed a lot of interest in zenon’s telecommander functions (e.g. Remote Desktop), the use of zenon for calculating OEE indicators and as a tool for PLC and downtime analysis. The innovative role of COPA-DATA also showed up in the fact that the Windows Vista™ certification and the full support of Windows CE 6.0™ were important topics for our visitors. New perspectives and applications in mechatronic engineering – in cooperation with B&R, EPLAN, Hirschmann and RITTAL – were presented in the Factory Arena.The strong interest of visitors and the lively discussions with other event participants are a clear indication for us that COPA-DATA will continue with a successful appearance at the fair next year. The COPA-DATA team would like to thank you for your interest and confidence. We are already looking forward to seeing you at the SMART Automation fair in 2009 ! *Hans-Peter Ziegler*

A raft ride with COPA-DATA An away day on the river Isar

A wooden raft, cheerful raft guides and hearty traditional music – all you need for a nice trip and a lot of fun!

About 50 COPA-DATA employees and business partners boarded a raft in Wolfratshausen, south of the Bavarian capital, on a beautiful morning in July. They set out on a jolly trip, with the first stage from Wolfratshausen to Munich. Aboard, the COPA-DATA crew was welcomed by a band that provided the right atmosphere for the trip with hearty traditional music. The traditional Bavarian atmosphere was enhanced by Bavarian beer and snacks. The trip on the Rivers Loisach and Isar took the crew about 30 kilometers through idyllic river sections and landscapes of the Isar valley.

They went on to “Mühltal” near Straßlach, where a typical Bavarian lunch – pork roast and dumplings – was waiting for them. There, the spare-time mariners were able to watch other rafts landing and sliding down the steep raft slides. An adventure that was also awaiting the COPA-DATA crew. After lunch, the COPA-DATA trippers went on to the first of the three big raft slides of the Isar Amper works. The first raft slide in the Mühltal valley is the biggest one in Europe, with a length of 365 meters and difference height of 18 meters – a really refreshing experience. The second slide in Baierbrunn has difference height of 9 meters. But the fun was not over – the third slide in Pullach was approaching, with a height of 11 meters. With each slide and every song of the band, the atmosphere on board was getting better and better – the passengers were dancing, singing and laughing.

The journey went on from the Mühltal valley past the Georgenstein, a nine meter high rock in the middle of the river, via Schwaneck castle and Großhesselohe to the final station in Thalkirchen. Finally, the cheerful crowd left the raft at the landing stage – the end of a wonderful company trip. *Susanne Garhammer*

Maintenance as scheduled

Product life cycles are becoming shorter and shorter, the complexity of production systems is increasing and the market requires more and more high quality products. In such a dynamic and challenging environment, it is hard to stay ahead of the crowd. When facing all these challenges, it is important to keep an eye on the permanent maintenance and optimization processes of the plant.

Industrial software technology can make an important contribution to the protection of investments. The rapidly developing software sector provides constant improvements regarding functionality, security and maintainability. Regular software upgrades keep systems up-to-date, avoid integration problems, offer important security extensions and support growth and efficiency by increasing the scope of functions.

The requirements of the market are diverse and are met by the individual and flexible applications created with zenon. Support by COPA-DATA is just as flexible. Every user has different questions and need of assistance. That is exactly what our support team takes care of. With a COPA-DATA service agreement, you can protect your investments and provide your teams with a perfect tool for a quick and simple resolution of all questions regarding zenon.

You can choose how much assistance you wish to receive from our support team. With your zenon license, you already receive all services from the “Basic” module free of charge. The “Advanced” and “Premium” modules allow you to adapt the COPA-DATA basic service to your individual requirements.

With the free module “Basic”, you can already reach our support team via telephone, email and the web portal. All “Basic” requests are processed in the order of their arrival. You can download manuals, videos and tutorials from our website and access the forum and the FAQs. You can get zenon version upgrades according to your standard conditions. “Basic” is part of your zenon llicense, provided you have undertaken COPA-DATA zenon training.

With the module “Advanced”, you will get preferred support, even outside of core office times. Your requests will be processed before any other “Basic” requests. We guarantee fast and qualified responses within two working days. Additionally, you will benefit from direct online meetings and training using the COPA-DATA WebMeeting tool. In the download area, “Advanced” will give you access to feature packs, sample projects, VBA examples and saved COPA-DATA workshops. zenon version upgrades can be obtained according to your usual conditions. You will also receive rebates for standard and individual training.

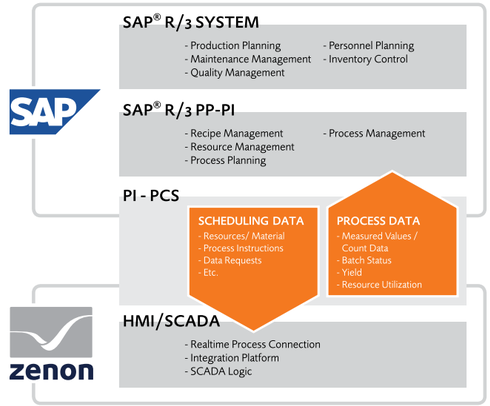
“Premium” gives you comprehensive services for all COPA-DATA products at one location. “Premium” guarantees the most current COPA-DATA technology at any time as well as exclusive service. With the free zenon upgrade service, you will make sure you always have the most current version while maintaining compatibility with all previous projects. Furthermore, “Premium” gives you maximum protection for “critical” and “severe” problems as your requests will be of highest priority. You will also have the option to request a call-back by our support team. Costs for “Premium” depend on the number of licenses you have. New licenses in the same calendar year will be integrated free of charge.

Any questions? Please ask your local sales representative about anything regarding the COPA-DATA support models.
Stefan Reuther

Direct link between SCADA and ERP:

zenon now has a certified interface with SAP® applications.

Today industrial companies have to deal with a large quantity and variety of information which directly affects the success of a business. Timely and relevant information can make a difference in relationships with customers, suppliers and competitors. To directly and positively affect performance it must accurately reflect real-time situations.



It is mainly manufacturing companies who are experiencing more and more pressure to optimize their processes owing to the strong international competition of globalized markets. Business processes forming or supporting the value chain are of particular importance for this. Analyzing and aggregating internally collected information allows a business to get new insight into internal structures, to optimize processes, to recognize adverse trends at an early stage and to make the right decisions at the right time. It is getting more and more important for managers at all levels in a company to use decision support information in real time for strategic reports, planning or to inform their actions: for example, consumption reports or information about lots and their costs.

ZENON SPEAKS SAP

True to the motto "do it your way", COPA-DATA supports flexible solutions with many different ERP systems. For the market leader in ERP, there is now a special extra: a direct interface between zenon and SAP applications – connecting the automation level and the management level in an intelligent way.

Management systems can now profit from the flexibility and independence of zenon. In cooperation with SAP and external consultants, we put into practice the requests of many users for a direct process connection to management information systems – including data pre-aggregation.

The important thing about this new development is that zenon learned to understand and "speak SAP". For example, in a solution requires the ability to directly transfer measured values, meter readings and malfunction reports from the zenon-controlled process to the SAP system, this is vital.

MEASURED VALUES

In SAP applications, "measured values" describe a certain status of a production system at a certain time in the process flow. Any process variable existing in the zenon system can be defined as a measured value. This allows transfer of protocol-independent real-time data from the process to the superordinated management level. In many cases, it is recommended to have zenon (possibly in combination with straton®) pre-aggregate the process data and then hand it over to the SAP system for analysis – e.g. mean values or statistical characteristics calculated from a whole value series. This avoids unnecessary overloading of the management system with raw data.

To keep the load on the system as low as possible, one can decide individually for every measured value whether it should be transferred spontaneously (i.e. only when the value changes) or cyclically (at configurable cycle times). After successful transfer, the SAP system analyzes the data and stores it in measurement documents. The measured values are thus then available for use in all other SAP modules.

METER READINGS

Particularly in the areas of production planning and monitoring, measurement documents alone are not enough. The management system also has to be kept up-to-date about current "meter readings" such as parts produced or materials consumed. A "meter" can be seen as a tool for displaying consumption, time in use or decrease of supplies. zenon allows you to transfer these meter readings to the SAP system. Of course, you can again use any process variable for these counters, and you can also choose between spontaneous and cyclical data communication. The SAP system then analyzes the transferred data, stores it in measurement documents and uses it for maintenance scheduling in the PM (Plant Maintenance) SAP module.

MALFUNCTION REPORTS

The scheduling system must at all times be informed about malfunctions, downtimes, etc. Productivity indicators can be calculated correctly only when the relevant uptimes and downtimes are known. The SAP system uses "malfunction reports" for this. In zenon, every alarm of a process variable can be defined as a malfunction report. The user can decide whether the selected alarms should be forwarded automatically or only after manual confirmation. Relevant reports, i.e. reports that require maintenance actions, are usually documented in SAP.

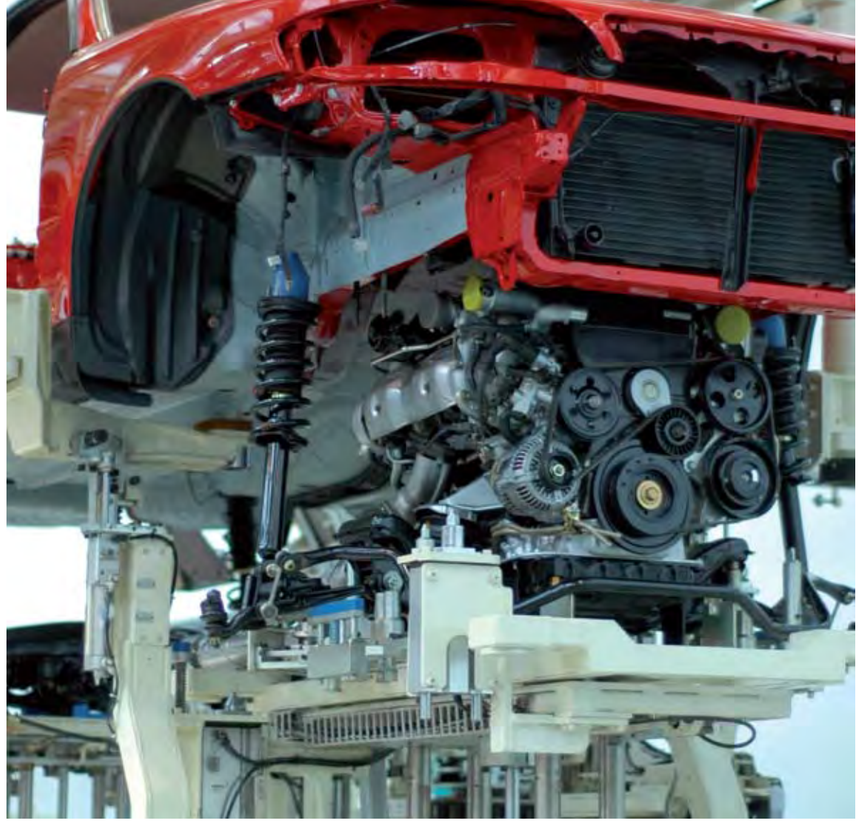
SAP CAN CONTROL ZENON

Starting with the original approach of simply exchanging process data, it quickly became obvious that a more global approach would be more eeffective. SAP was convinced by this and therefore decided to certify it: a bidirectional interface that allows control of zenon from within SAP applications. This optimized control process structure significantly increases efficiency with its improved data preparation capabilities. The appropriate interface in the SAP system is the widely-used PI-PCS interface. It already allows for the designing of a production process in the SAP system. The advantages are clear: on the one hand, the SAP system is always up-to-date about stocks and production orders; on the other hand, it also knows all current process states due to this intelligent connection. This in turn allows for the active and targeted manipulation of processes, for example of a production plant, from one central system. zenon has the necessary intelligence to execute the received control commands and put them into practice in the process. In this bidirectional communication structure, both systems constantly exchange information and control commands. Immediately following the completion of a phase, or production cycle, the management system already has the latest data and can therefore immediately trigger subsequent processes.

SCADA AND ERP ARE MERGED

With the integration of this interface, COPA-DATA has managed to merge the process level with the management level. From now on, both worlds will profit from one integrated solution. No more redundant data processing in two separate systems, or error-prone and time-consuming manual data transfers or investments in third-party software. From late 2008, all zenon and SAP users can profit from this integrated solution. The COPA-DATA solution was officially certified by SAP in the summer of 2008. Users can therefore be sure that all communication and interface standards defined by SAP are observed and that zenon will integrate smoothly with SAP applications.

Reinhard Mayr



the *zag* – the Wizard for the automobile industry

Work more efficiently with the zenon automotive generator

In the automobile industry, data types (variables), symbols and pictures are highly standardized and as a consequence they are often reused. A wizard that automatically analyzes PLC data and then creates the associated zenon visualization projects would be extremely useful in this industry. With the new zenon automotive generator – or the *zag* – COPA-DATA has created just that: a project generator for the automobile industry. The zag can process data from different sources, such as PLC programs for Simatic Step7 or Phoenix PC WORX. But the zag can also analyze other data, e.g. CAD sources.

the *zag* works almost completely autonomously: the wizard creates about 80 percent of all necessary information automatically; only 20 percent must be adapted manually. Equipment data serves as the basis for the automatically generated visualization projects. The zag analyzes the data and then automatically creates a zenon project. Thanks to the use of standards, the predefined basic projects are automatically generated and then integrated according to the specific project. The number of equipment – conveyor belts, drives, sensors, robot stations – and the allocation of variables for every aggregate are automatically defined by the zag. After this generation run, the user can access all necessary information in the project.

FAST, SAFE AND ERROR-FREE

The advantages of the zenon automotive generator are obvious: The Wizard drastically reduces the required engineering time and cost. Besides the reduced engineering effort, the training cost is also lowered. At the same time, using the zag reduces engineering errors. Error-free projects increase engineering reliability and the reusability of project parts. Additionally, companies using the zag are independent of PLC and visualization hardware producers. As the zag uses the entire set of automatic engineering functions of the zenon Editor, all the zag generated projects have the typical enhanced features of a zenon project, such as resolution independence, multi-language support and hardware independence. Projects generated with the zag run in all operating systems from Windows CE to Windows VISTA or Server 2008, both as single workstations or as control systems.

THE ZAG – WHAT IT CAN DO

The zag creates zenon project parts based on template data that can easily be adapted to the PLC program structure, the equipment description or external data sources. For the generation of zenon projects, there is a large variety of templates, general pictures, data types, template variables and symbols. In combination with the template project, a complete HMI/SCADA project is created and any changed data in the project is updated automatically. With the zenon Editor, users can adapt the design and functionality of the templates according to their individual requirements. Changes performed later are automatically passed on to the related picture elements.

For project maintenance and update, the two data sets (zenon and the other data source) can be combined. Manually performed changes remain untouched by the generator, offering maximum freedom for manual modifications.

Additionally, there is a function for comparing data from zenon and the other data source. The user can also define the manual changes to the HMI/SCADA project that should be replaced by the zag and the ones that it should preserve.

THE ZAG – IT'S AS EASY AS THAT

The zag makes full use of the VBA interface of the zenon Editor. For that, it is included as a Wizard. The first version of the zag generates project parts based on an Excel file. The Excel file contains:

- Equipment data (group/equipment identifier)
- Component data (equipment part)
- Data about the type of each element (e.g. rotary table, lifter, lifter table, conveyor, clamp) their names and addressing information.

Let us look at an example:

The group name "Equipment01" and the equipment ID "Production" result in the zag checking whether there is already a picture with the name "Equipment01_Production". If it does not exist, the zag will create it.

The corresponding picture switch function and an entry in the main menu for showing the picture are also created automatically.

Based on the name "Lifter", an object of type "Lifter" is created in the zenon project. Based on the keyword "Lifter", the zag uses the correct data type and picture symbol with the same name. The Wizard adds this picture symbol to the picture "Equipment01_Production" and links it to the corresponding variables.

The element name "01LF01 " is used for creating the variables. The variable "01LF01" of the structure data type "Lifter" is generated with the offset information from the data source. The variables are then linked to the picture symbol "01LF01". The info text "Lifter 1" is a description of the picture element and linked to this symbol.

The functionality described here is included in the first version of the zag. The variety of open interfaces in zenon allows for numerous expansion options. Using a project generator like the zag further highlights the advantages of an independent and open HMI/SCADA system. There are no limitations to the type of hardware systems used – neither on the PLC side nor on the display side. Thanks to the use of open interfaces, the zag can be adapted quickly and easily to any requirement. *Bernd Wimmer*

IEC 60870 and IEC 61850 for straton

When it comes to communication protocols for automation within infrastructure applications, there are two standards of particular importance in Europe and parts of Asia: IEC 60870 and IEC 61850. zenon and straton master both protocols, complementing each other during projects in an ingenious way. Let us have a look at these standards...

The IEC 60870-5 series of standards makes sure that telecontrol and station control devices and equipment can communicate with each other without requiring any fundamental adjustments. The IEC 60870-5 contains the following parts of telecontrol:

- IEC 60870-5-1 Transmission Frame Formats
- IEC 60870-5-2 Data Link Transmission Services
- IEC 60870-5-3 General Structure of Application Data
- IEC 60870-5-4 Definition and Coding of Information Elements
- IEC 60870-5-5 Basic Application Functions

The protocol standards are worded very generally. This fact has lead to the definition of so-called companion standards to ensure the interoperability of devices communicating with each other. The following companion standards are of importance:

- IEC 60870-5-101 – Application related standard for telecontrol tasks (serial communication)
- IEC 60870-5-102 – Basic functions for the transmission of integrated totals
- IEC 60870-5-103 – Standard for the informative interface of protection equipment
- IEC 60870-5-104 – Application related standard for telecontrol tasks in IP networks

The interface uses a signal oriented data model. Every telegram represents one data point, e.g. a measured value, a set point command or an alarm. This telegram is defined with an address and a data type. The address defines the type of signal. This means that both the sender and the receiver must know the meaning of the address.

For example:

- (1) Single point information
- (4) Double point information with time tag
- (31) Double point info with time tag CP56Time2a

The so-called interoperability list contains all the important information to predetermine the interaction of IEC 60870 master and slaves regarding supported protocol properties.
The IEC 60870-5-10x protocol also defines that messages and values must be sent spontaneously from the slave to the master after a change; there is no polling mechanism. After establishing the connection, the master sends a general request command to the slave to determine the current status of all data points. After that, the slave monitors and reports data point changes.

STRATON AND ZENON IN A TEAM

Just like zenon, straton can also "speak" IEC 60870. As the Slave, straton meets the IEC 60870-5-101 and IEC 60870 -5-104 standards. As the protocol stack is available in a platform-independent form, it can be used for the COPA-DATA soft PLC under Windows as well as for many other operating systems such as Linux, QNX, VxWorks, etc. This fact is also of great use to COPA-DATA's subsidiary COPALP, which develops platform-independent software.
With zenon as the control system and straton as the station control device, the two form a perfectly synchronized team. zenon is the Master, observing IEC 60870 protocols, and straton is the Slave. That is why it is suggested to use the IEC 60870 driver as the communication basis of straton projects in the zenon Editor. The big advantage is that address information has to be entered only once.

The IEC 61850 standard differs from the IEC 60870 standard in that it is not specified as a telecontrol protocol and that it does not have a signal oriented data model. At the moment, the IEC 61850 standard is only used in station control and has a strictly object-oriented data model. The name of the object in plain text is used for identification. The objects are self-describing, which means that the structure of the objects is transferred with the object itself in the telegram.

The series of standards mainly defines:

- general definitions for switchgear
- the most important information for functions and devices
- the information exchange for protection, monitoring, control and measuring
- a digital interface for primary data
- a configuration language

The protocol uses TCP/IP as the basic transmission protocol and the Manufacturing Messaging Specification (MMS), which is defined as classical client-server communication in the IEC 61850-8-1 standard. Additionally, it describes two so-called peer-to-peer services for real-time communication, which are based directly on the Ethernet protocol:

- Transmission of fast sampled values according to IEC 61850-9-1 standard
- Transmission of GOOSE messages according to IEC 61850-8-1 standard

As opposed to the IEC 60870-5-104 standard, the IEC 61850 is only defined for the station bus. Therefore, it cannot be used for transmitting process data between the stations and the control system. To allow for this, data must first be mapped, for example to IEC 60870-5-101/104. Both zenon and straton can do this.
straton now has an IEC 61850 server including GOOSE. This means that a substation can be fully equipped with straton devices. Its counterpart is – as usual – zenon as the control system and IEC 61850 Client. Later straton will also be available as an IEC 61850 Client for example to execute automated switching action as a superordinated station computer.
Just like the straton IEC 60870 Slave, the IEC 61850 Server is also available as a platform-independent implementation to be used on other operating systems than Windows.

Jürgen Resch

FAQs

› straton on an XP/Vista computer: What is the difference between the settings: "Realtime priority" and "Hard realtime"?
The setting "Realtime priority" in the zenon Editor increases the priority of the straton task in the operating system. This ensures a higher priority of the straton task compared to other "normal" Windows and Office tasks.
"Hard realtime", on the contrary, is only possible with the straton Realtime Kernel. It runs as a Windows-independent Kernel. The cycle times of the straton project remain approximately the same compared to the straton Runtime. The advantage of the Realtime Kernel is its low jitter of about 100µs. The Realtime Kernel can only be started with the straton Runtime Manager. One drawback of the Realtime Kernel is the fact that it can only be started once per PC.

› What is the large number of the variable status, which I can see in the diagnosis viewer, or in the SQL database when using the SQL driver or exporting archives in SQL?
This number is the Hexadecimal representation of the status bits of a variable. If you convert this Hex number into a binary number, you will see, for example, that for spontaneous values, bit 17 is set (true or 1). This corresponds to the "SPONT" bit 17 in the status processing documentation. Many status bits are set by the application itself, but there also exists user status bits. Some status bits, which can be set by the user, have special functionality; e.g. to turn off the communication to the PLC.

› When I start the runtime automatically with the PC through the autostart folder or through the run section in the registry, I sometimes experience difficulties with the zenAdminSrv service. The following start delay entry in the zenon6.ini has already been made, but it does not help.
[DEFAULT]
STARTDELAY=5000
The zenon6.ini entry will be executed only after a successful check of the zenAdminSrv running.
In this case you need to start the zenon runtime with a *.vbs script which needs to be executed within the autostart of the operating system. This file then executes the delayed zenon runtime start.
You need to create a file with the extension *.vbs and to enter the following code:

```
Option Explicit
Dim objShell
Dim intWarten
intWarten = 5000    ' Milliseconds
WScript.Sleep intWarten
Set objShell = Wscript.CreateObject("Wscript.Shell")
objShell.Exec ("Path, where the zenon Runtime is located")
'e.g. ("C:\Programs\COPA _ DATA\zenon 6.22\Zenrt32.exe")
```

Finally, link the script to the autostart folder of the operating system.

› Are there any special Vista specific settings for making zenon runtime run correctly on a 2 monitor system? I've tried with a zenon 6.22 project that is running on a 2-monitor Windows XP SP2 system without problems, but no luck in Vista so far?
There are no special settings needed for Windows Vista concerning monitor administration. However, the following requirements must be considered: In the zenon6.ini the real monitor resolution has to be entered, so that the monitor administration works correctly in a multi-monitor system. The only exception is the WEB client. There, these settings are not necessary. The following ini entries are necessary here:
[DEFAULT]
RT_CXMAINFRAME=2559 Width of the main window in pixels
RT_CYMAINFRAME=1023 Height of the main window in pixels

Please be aware that the entries have to be one pixel less than the real monitor size, as counting here starts with 0. The numbers of the example above are the settings of a double-monitor system, where both monitors have a resolution of 1280x1024 pixels (width 2x1280-1=2559, height 1024-1=1023). If the values are higher than the actual available area, it can be that nothing is displayed! For example: If the Windows taskbar is set to "fixed", nothing is displayed on the second monitor, because the place the taskbar itself needs limits the available place for application windows. This problem can be solved by either setting the Windows taskbar to "automatically hide" or by setting RT_CYMAINFRAME to a value which is even or less the remaining pixels of screen resolution minus taskbar; e.g. if the height of the taskbar is 50 pixels, then the available space on a 1280x1024 pixel screen resolution is 1024 - 50 = 974 pixels. The value itself then is 974 -1 (counting starts with 0, see above): RT_CYMAINFRAME=973.

› Although I manually transferred the new versions of the zenon CE files to the CE panel, after the transportation of the zenon project files the driver dll´s and the ZenNetSrvCE.dll are from the old version again.
On transporting the zenon project to the CE panel, the platform and operating system of the panel is automatically being detected. Using this information the remote transport decides which folder of the CE installation the zenon application files are coming from e.g. C:\Program Files\COPA-DATA\zenon 6.22 SP0\CE\CE500_x86 for a x86 panel with windows CE 5.0. The remote transport compares the application files from the CE panel and the automatically detected folder, if the files differ they will be transferred in additional to the zenon project itself.
So if you want to update the zenon CE files copy the correct files to the correct folder in the zenon CE installation.

› Which operating system authorizations are required for executing the zenon Editor and the zenon Runtime on a PC?
From zenon version 6.21, both the Editor and the Runtime can be started by a normal Windows user. No special administrator or main user rights are required, which was the case in the earlier zenon versions.

› It seems to be no longer possible to connect to the databases created by zenon. Only the system databases (master, model, tempdb and msdb) can be reached. What is the reason for this?
SQL Server 2005 creates a Windows user group for every SQL instance, e.g. SQLServer2005MSSQLUser$<computer name>$ZENON_DEV . If the current Windows user is not in that group, there can be problems when connecting to the SQL instance. This problem shows up no matter what rights the user has by membership in other groups; e.g. it will also appear if the user is a member of the local administrator group.
› The error „Wkwin32.dll" WK 1128 – appears on starting the zenon editor or runtime, although the Wibu-Key software out of the control panel can read the information from the dongle.
The Wibu-Key software is not automatically updated with a new zenon version. If you e.g. have Wibu-Key version 4.10 installed and try to use it with zenon 6.22 with a parallel dongle, this message may appear. To resolve this problem, download the latest Wibu-Key runtime from the Wibu homepage (www.wibu.com), or start the wibu key software installation from the zenon installation DVD.
Wolfgang Moser, Support Manager

There are no stupid questions. But there are questions that help us make zenon better, simpler and more useful. There are questions that tease insider information out of our experts. Some of them are asked via the COPA-DATA forum on our website, some reach us via the support hotlines and some arise during training sessions. Some of the most interesting among these questions will be answered right here in this issue of IU. You are sure to find even more of these pearls in our forum, where you should always find concise answers to your questions.

Do it your way!
Why?

Since April, COPA-DATA has had a a fresh new outfit. New colors, new logos, a new design. Why make such a big change after more than 20 years? And why now? The IU editorial team talked to COPA-DATA CEO Thomas Punzenberger, art director Eva Plainer and brand manager Markus Stangl about colors, shapes and backgrounds.

IU: At the moment, many companies are afraid of the future. COPA-DATA, however, gets a completely new design. Does the current crisis not affect you at all?
TP: Well, our new design was already finished before the current global crisis. But we would not hesitate if we had to do that now. In the past years, COPA-DATA has grown very successfully – without any venture capital or stock quotation, but with a very strict orientation towards market requirements. From the very start, we decided that the requirements and desires of our customers should be our yardstick. Of course, you might call that dependence; but it is a very productive and supportive strategy.

IU: How do you handle the current economic crisis? Have you already noticed any effects?
TP: We have to face situations such as this one head on. I think we have positioned ourselves well in time. Of course we have noticed that some companies, especially in the automotive industry, are more careful about investments and rethink scheduled projects. But we serve many different industries, and that allows us to level out fluctuations in individual markets. Not all industries react in the same way and at the same time. And as we are only obligated to our customers (and not to shareholders or analysts), we have much more freedom to act than others. Of course, we will carefully watch the development of the crisis and consider possible consequences for our strategy. But we do not see the crisis as a stop sign; we see it as an encouragement to keep on our course of independence.

IU: What is the difference between the old and the new design?
TP: It differs in just about everything!
EP: That is true; there is nothing that we have not changed. I think COPA-DATA now has a more sophisticated appearance. Design and Corporate Identity (CI) have been coordinated. The new design underlines brand values such as friendliness and innovation. The innovative product from the innovative company now also has an innovative design.
MS: I agree: As the innovation leader, you cannot have the most conservative design in the industry. We want to make a clear statement by reflecting our innovative product and our product leadership by using a highly progressive design.

IU: Subtle tones of grey and aubergine instead of red and blue. Is COPA-DATA growing up?
MS: After twenty years in the software industry, you are an experienced player rather than just an adolescent, and that must have an effect on our brand. We had already actually moved away from the red/blue combination you mentioned. In recent years, we used solid dark blue with a lot of white space. However, this combination is used by almost every other technology company, which makes it hard to create a unique and outstanding image.
EP: Red and blue are a strong contrast and therefore do not communicate a friendly image.
MS: We were looking for a tailor-made alternative instead of simply using some simple color combination. Our new aubergine color gives us a unique appearance and at the same time perfectly communicates our brand values. It stands for premium quality and conveys an image of sincerity without appearing too cold or reserved. For highlighting our products, we have some more vivid colors such as orange or lime.
EP: The color aubergine forms a quiet and pleasant background that radiates a feeling of warmth and security. The old red tone continues to exist in the orange highlighting tone. It becomes softer and warmer owing to a higher proportion of yellow and goes well with the aubergine color.

IU: What does the redesign mean for the product?
TP: The most important design elements will also be incorporated in the zenon and straton products.
EP: This will lead to a better look & feel and increased usability.

MS: If you value the design of a product, you will get products that are really user-friendly. Since version 6.21, we demonstrated how seriously we take the whole topic of usability. Product design is, of course, a part of corporate design. A very essential part, we think. This applies to software solutions like straton and zenon as much as it does for hardware like cars! We will pursue this strategy and set new trends, as usual.

IU: What was the biggest challenge during the redesign phase?
EP: Definitely the redesign of our logo. It was a real necessity, but brought with it a lot of effort and cost. When you redesign a company's logo, things get really serious!
MS: It is not easy to let go of familiar and simple solutions and to strike new paths. For example, we had to change the big O of zenon because it looked kind of "over-designed" in combination with the new elements – and hard to type! Another example: we had to find a single claim to sum up our range of products and services and at the same time avoid unnecessary and empty phrases. Now we have to find out if we made the right decisions. Our first experiences of this have left us very optimistic.

IU: Your new claim is "do it your way!". Are you referring to Frank Sinatra – or is there a different background?
TP: Above all, "do it your way!" refers to the independence that our customers get with our products. They can realize their ideas with zenon and they can go their own way to find an optimum solution.
MS: Well, there is already an Austrian home improvement store that uses the Sinatra lyric in their advertisements. I actually prefer "We will rock you". But I could not convince my more serious colleagues with this suggestion. Seriously now, the claim expresses in a wonderful way both how customers benefit from our offers and how we think and work. That's what it is all about: the freedom to do your own thing.

IU: What can we expect in the future?
TP: We are now concentrating on the propagation and implementation of our new design. We have just started with that. Many customers are only beginning to realize that something has changed.
EP: There will also improvements of the product itself. zenon will be redesigned, so that our customers will also benefit from the new design in their everyday work, in addition to the well-known efficiency of our product.
MS: What awaits us? "The future", I would say. We have to and will remain flexible and adaptive to the emerging market and the innovation from within the company. This makes me think of a slogan that we used during a trade fair two years ago: "Do whatever you want. zenon is with you." – "do it your way", as I said! *IU*

“Again, it [the Analytical Engine] might act upon other things besides number, were objects found whose mutual fundamental relations could be expressed by those of the abstract science of operations, and which should be also susceptible of adaptations to the action of the operating notation and mechanism of the engine . . . Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent.”

AUGUSTA ADA KING, COUNTESS OF LOVELACE (1815 – 1852), British mathematician

The development of Babbage’s computing machines is inseparably connected with the work of Ada Lovelace, who presented a written plan of how to calculate Bernoulli numbers with the “analytical engine”. This algorithm brought her the distinction of writing the first computer program. Her idea of a machine that manipulates symbols according to rules and the insight that numbers can also represent other things than just quantities, mark the shift of perspective from calculations to computations (data processing). Ada Lovelace was the first to have the visionary idea of using computers for tasks other than mathematics.

zenon under full sail:
With Reinhard Mayr and Markus Stangl at the Ecker Cup

PROLOGUE: FALL 2006

ZENON: When Reinhard Mayr and Markus Stangl decided to take part in this regatta in fall 2007, nothing could make me stay with developers in the lab! I had to join them, after all sailing is all about control; the crew must build a network and communicate in all directions. Perfect for me, at least, that is what I thought. But then … I will never forget that night, and for the next holidays? I will stay ashore! I wonder where Günther is taking us? But back to the trip…
It all started when Reinhard started rhapsodizing about his cruise in the Greek Aegean. These holiday memories quickly turned into the idea of taking part in a completely different cruise: the Ecker Cup 2007, a challenging regatta, which Reinhard had joined previously in 1998 and 2000. A wonderful regatta, which I simply had to participate in!

THE ECKER CUP

REINHARD: It started in 1990. The idea of organizing a long-range regatta for cruisers turned into the 1000 miles Ecker Cup race, an important event for Mediterranean regatta enthusiasts. The basic idea was for a long-range race that has proved itself over the last 17 years: holiday cruisers with racing ambitions get the chance to cover a distance of 1000 nautical miles within 14 days.

In 1990, only a handful of crews took the challenge of sailing around the clock for fourteen days, with just one stop. In 2007, about 1000 sailors with 110 yachts registered. In the middle of October 2007, the 11th regatta started.

SPRING 2007

REINHARD: The crew consists of four experienced open sea sailors and three enthusiastic newcomers. All we need now is a boat. The decisions are not easy, after all, our whole strategy depends on it. How big should the boat be, where do we charter, how old should it be, what equipment would we need?
We settled on a relatively old but proven Bavaria 44 craft with a good yardstick number (a rating system). That allowed us to completely rely on the skills of our team.

SUMMER 2007

ZENON: We have all the necessary equipment; I have updated myself to the newest version and hacked into Markus' notebook. They are wrong if they think I will stay at home with the developers!
REINHARD: Everybody is equipped with what they need. Everything must be waterproof, warm and, above all, secure. During the two weeks we will only come ashore for one day. That means we will have to take a lot of supplies with us. But what exactly and how much? If we take too much, we will be too heavy and slower. If we don't take enough, we risk a mutiny and starvation. Therefore, we decide in favor of quantity!

THE FIRST REGATTA WEEK

Sunday, October 14, 2007

ZENON: We made it! We are sitting here, in Zadar harbor. Tomorrow we will start: two weeks across the Mediterranean. Things are finally calming down. Everything's fine, and above all it's too late to change or improve anything. From now on, our fate lies in our own hands. On the one hand, we want to come home in one piece. On the other hand, we want to finish with a good time.

Today, they were tinkering around with the notebook. I hope they didn't discover me. It was hard enough to get aboard. The notebook is supplied by the 12V on-board supply and I am hooked up to the on-board GPS in a rough-and-ready manner; but I have a superfast UMTS connection to the whole world. If only I could get past the firewall …
REINHARD: It was the right decision to take a boat that was not completely new. It is one with a shallow draft, which means that we have less heeling and can therefore sail faster. Besides, we have an excellent yardstick number. They even corrected it again in our favor. That was a good sign!

Monday, October 15

▸12:00 noon – Zadar, Croatia The first stage. 520 nautical miles to Katakolon, Greece. Deadline: Saturday, October 20, 2007, 11:00 a.m.
MARKUS: We are returning to the harbor at Zadar to get some diesel. The current weather forecast predicts calm, which made us drop our original decision to sail with only a half-full diesel tank to save weight. We are probably going to need more than just a few liters, although the rules allow only one hour of engine use per stage. Every further hour will be counted threefold. After all, it is a sailing regatta.
ZENON: I have just noticed that I am not the only stowaway aboard. There is someone else in the engine bay. You can hardly see him, but I do not miss anything around here. They have installed a little black box that records everything: whether the engine is running and when it is put in gear. It seems they don't know that I could do that much better – what ignorance! Anyway, the engine bay is not really a nice place, I prefer staying here in the control room.

▸1:00 p.m. – Zadar, Croatia
MARKUS: I can't believe it. We missed the start because we didn't see the signal rocket and didn't hear the starting shot, and on our radio channel, some Croatian fishermen were talking about heaven knows what – with a tremendous transmitting power. But as everybody else was starting, we thought the race must have already begun. The route specified for the start by the regatta management was to the North. If you know the region of Zadar, then you will also know there are a number of islands off the coast and the next chance of leaving the Croatian island world would be to go between Dugi Otok and Katina (Kornati).

▸5:00 p.m. – North of Zadar, Croatia If the wind drops, 90 percent of the boats turn into the channel between Dugi Otok and Kornat. Our strategy was different, because the weather forecast predicted better wind outside the islands than through the channel. It is a detour, but nevertheless it should be faster. We use our one hour of free engine power and continue to the North to get directly to the open sea.

▸6:00 p.m. – South of the island of Molat We just received the command: engine off, the free hour is over. Unfortunately, the wind apparently did the same. We are drifting south of Molat and waiting for better wind, together with two other boats.

Tuesday, October 16

▸12:00 noon – Open sea, south of Kornat There was hardly any wind until the morning. We even had to use the engine once so we would not drift towards the cliffs. In the morning, the promised wind finally came up. We were getting ahead really well, but now the wind has dropped off again. It is very misty. We cannot see the other boats. On the radio, we hear

that the poor visibility is owing to "blue diesel haze" and that the fleet has already turned on their engines and continued to the South. First discussions as to whether we should also use the engine or not.

4:00 p.m. – West of the island of Vis, Croatia
We started our engine and headed towards Brindisi, Italy at full throttle. Absolute calm in the whole Adriatic Sea. The water looks like oil.
ZENON: Today I was on deck a few times to download current weather data, also helping my display to some fresh sea air. Well, there was not really any wind, but a lot of sun. With various acrobatic postures Markus tried to increase the range of the UMTS signal. That is the downside of sailing across the open sea - there are no antenna towers and therefore no connection, no weather forecast and no routing. I wouldn't mind drifting around in the sun for a few days. I think it's much nicer on deck than below.

Wednesday, October 17

1:00 a.m. – 20 nautical miles northeast of Gargano, Italy
MARKUS: That was a fantastic sunset. A thrilling experience – if it wasn't for the race we are participating in. Now we are sailing around in the wake of some tankers and other giant ships in the pitch-dark night. A lot of traffic here. We do not take our eyes off the radar. We had to change our strategy one hour ago, because our fuel gauge has deceived us. We are approaching the port of Vieste with our last 5 liters of fuel.

4:00 a.m. – port of Vieste, Italy
We are anchored in the port and waiting for fuel. Or rather, for the return of the fisherman, who also owns the local gas station, from his night's work.

10:00 p.m. – near Brindisi, Italy
REINHARD: Tom turned out to be a real water saver. We have not emptied our tanks since the start, but he is still saving water. You never know! The good thing about it is the whole crew got a salt water shower today. One after the other was scrubbed. Tom got an extra thorough cleaning with the big broom. The shower seems to be a bit too cold for our navigator. His screams can probably be heard all the way to the stage destination Katakolon, even though we are still idling around near Brindisi. Our on-deck showers also attracted the attention of the yacht lying next to us.
MARKUS: We will soon leave the Heel of Italy behind us and continue towards Greece across the Ionian Sea. Still, the weather is as calm as it could be. The only thing driving us is the sea current to the South. Speed through the water: 1 knot, ground speed: 3 knots.

Friday, October 19

7:00 p.m. – between Kefallinia and Zakinthos, Greece During the last few days, to sum it up, there was little wind, rain, total calm and currents... in any combination. We had numerous discussions about whether we should use the engine or not. By now, we have created a sophisticated mathematical model on the computer, which is supposed to help us make a decision. But the discussions still go on! The course is ahead, but from astern there is now a storm front approaching. Will it reach us in time and will it bring enough wind? 50 nautical miles to go and 15 hours time for it.

Saturday, October 20

2007 – 9:43 a.m. – Port of Katakolon, Greece
We made it! We are one of the last ships reaching the small port of Katakolon. But we don't care. We are happy that we made it. Who knows how much engine time the other ships needed to get here? Now it's time to restock our water, food and diesel supplies. However, there is still enough time for some sailor chat, accompanied by Austrian beer and food.

SECOND STAGE

Sunday, October 21

9:15 a.m., port of Katakolon, Greece – Skipper briefing
MARKUS: To our surprise, they gave us a reason to celebrate yesterday evening. We were the leaders of our group, with a lead of 20 minutes, and ranked 21st in the overall standings. This gave us a lot of motivation for the second stage – 320 nautical miles to Samos. However, we are a bit worried about the weather forecast.
REINHARD: Have just received the current weather forecast. Wind Force 8-9 predicted for today. The port police told us to leave the port, as it is not safe enough for the predicted weather. This is not going to be funny ...

10:00 a.m.
Final preparations on board. We prepare the boat for the bad weather. Everything that could fly away is fastened down or stowed away; we have "battened down the hatches". Heavy things are put in the lower compartments. The team is preparing for the worst; everybody is checking his lifebelt and the lifejackets are placed within reach. Better safe than sorry!

11:33 a.m.
REINHARD: Leaving the port and entering the start area. Everything looks fine. Enough wind for a good start. Why wasn't the weather like that during the first stage? Roman will start. Our strategy is once again different from the others; we are planning to get to the open sea with two long legs. We want to be in open water when the storm reaches us.

12:15 p.m.
MARKUS: The starting shot! This time we heard it. We are one of the first to start. Wind at 15 knots and rising. The first boats have turned North right after the start to look for a harbor where they can wait for the storm to pass. We stay on course and continue South, sailing close to the wind like most of the others.

1:10 p.m.
The wind is getting stronger and stronger. After one hour, it has gone up to 25 knots and rising. Our ship already has over 45 degrees of heeling (tilted over to one side).

1:30 p.m.
We are now standing on the sidewalls of our cockpit table to avoid falling into the water. Massive heeling; we are still sailing with full sails and the wind is getting even stronger. 30 knots, then 35 knots, a storm front is approaching. We can see the dark grey clouds. Another yacht is about 50 meters ahead of us, slightly to the right.
ZENON: What's happening? They just taped my home to the navigation table. What a cheek! They act as if I have not found my sea legs!

2:00 p.m.
The front has reached us, with 40 knots of wind and strong gusts up to 50 knots. Time to lower the sails; which is extremely hard in such high winds.

2:05 p.m.
A gust has just opened a clamp of the main sheet (sail) and the main boom has swept all the way to portside. Luckily, no one was hurt; however, our main sail is now ripped, so we will only be able to use it in the second reef.

2:10 p.m.
MARKUS: It's raining hard; visibility is 10 meters, which means we can just see our own bow. I hope there is nothing in front of us!

2:12 p.m.
MARKUS: It's raining hailstones as big as 2 cm. Where is the other boat that was right in front of us just a little time ago?
REINHARD: We are sailing right into the middle of the low-pressure area. We have all put on our weather-proofs. Only Roman is standing at the rudder in shorts and T-shirt, fighting fiercely. The visibility is getting worse. Those who are not needed on deck go below. Above all, we now need someone at the radar to watch out for the other ships. Time for a change of the helmsman; it's my turn.

2:12 p.m.
REINHARD: Visibility is down to nothing, I can hardly see our own bow. The waves are not that big, but it's hard to keep the boat on course because of the strong gusts. The pressure on the rudder is extremely high.

2:15 p.m.
MARKUS: Sitting in front of the radar, but it doesn't work in this weather. It only shows a black disk. I hear screams from above.

2:17 p.m.
REINHARD: What a shock! The boat in front of us just turned around right in front of us. That was really close. I could see right into the eyes of the other helmsman. Why did they change

the course in this weather, without thinking of the consequences? The radio is buzzing now; we hear all kinds of bad news, from ripped sails to lightning strikes. Things seem to be getting really rough now.
ZENON: Many entries in the boat's alarm list, there's a lot going on now. But nothing that could really surprise me, why don't they let me take over for a while?

▸2:30 p.m.
MARKUS: I am on deck again and we are still in the middle of the storm with strong changing winds from all sides. Reinhard is fighting against the weather wearing a grim expression; he can hardly stay on course. Big waves are slowing us down. Without speed, the rudder has hardly any effect. The boat is tossed around like a cork.

▸2:33 p.m.
REINHARD: I've never seen something like this: a pirouette with an eight-ton boat. While we were in the middle of the low, the wind turned around a full 360 degrees within a few hundred meters – taking our boat with it. Thank heavens that nothing happened; we can now roughly stay on course again. Even if we do not get much closer to our destination, we can at least keep the boat in a steady direction.

▸2:45 p.m.
MARKUS: The wind has calmed down and also stabilized a bit; we are now sailing South, on course and close to the wind. The waves are hitting us right on the bow.
REINHARD: My team has survived the storm – in a more or less good condition. At the moment, two of us are taking turns at the rudder. Our two youngsters help us out with the navigation system, the sail trim and the radar. The others need a break. I wonder what the night will be like.

▸3:14 p.m.
REINHARD: Our boat is starting to suffer some damage too. Nothing serious, everything is flying around in the boat, and I am not talking about the old socks from last week! On deck things look quite good; the sail is working although it is ripped – right now we don't need much more sail area anyway. We cannot see any of the other boats. On the radio, we heard that some sought shelter in the port of Pilos.
I am soaked to the skin. The water is coming from all sides, 1 ¾ hours left till we change watch – then I will try to doze for a bit. Sleeping isn't possible.

▸3:30 p.m.
MARKUS: Tom doesn't feel good. It's his stomach. He wanted to sleep in the cabin near the bow but he hit his head because of the strong swell, first on the ceiling and then on the floor. Now he is lying, firmly tied on deck, with a white face. Well, the fresh air should make him feel better!

▸8:00 p.m. – North-west of Pilos
It's getting dark. After just a few hours, only three of the seven crew remain fit for sailing.
ZENON: Three? What about me? A redundant system could help you out. But the boys have to do everything on their own. Maybe I should make myself noticed?

MARKUS: We think about what we should do. The next sheltered port is in Pilos. The storm could last for hours or even days. Should we go on? Or give up? ...a difficult decision that must be made by all team members. Despite the ripped sail and the ailing crew, we are actually quite fine – compared to the others. We hear messages on the radio about torn sails, lightning strikes, broken main booms and injuries. 35 ships seek shelter in the port of Pilos.

▸8:02 p.m.
REINHARD: Dozed a bit. It has become dark and a bit quieter, but still with winds of more than 40 knots. The skipper has just woken me. Half-asleep, I have to decide whether we should go on or turn into a port; time for a quick team talk about our situation. We decide to go on, even if it's going to be hard. The good thing about it is that the whole team wants to continue, so we get dressed and sail into the cold dark night.

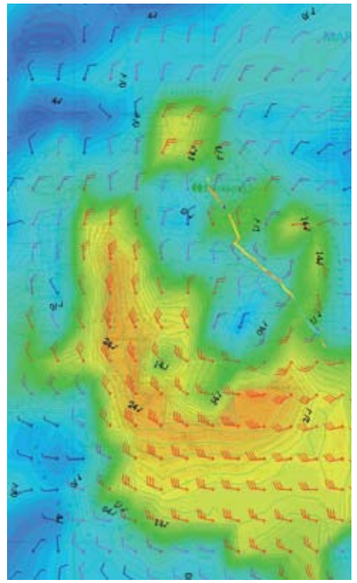
MARKUS: We just had a team meeting. Although only 3 of us are fit, we all decided to go on. Reinhard and Roman, the best sailors of us, take turns at the rudder. I am now the navigator, by decree of the skipper. That is a good job, because you get to sit in the cabin...

▸8:31 p.m.
REINHARD: I am back at the rudder and Roman gets a well-earned break. During the night, it gets even harder. You can't see the waves approaching the boat in the dark. It's more like a rodeo than sailing. With lots of careful steering, we can make headway, but I cannot help my friends to have a quiet night. We are constantly going up and down. I hear a low growl from below – probably someone who has crashed into something again.

▸9:23 p.m.
MARKUS: For the second time, I slid about three meters into the shower unit, in free fall. 45 degrees of heeling, a slippery floor and a boat that is bouncing up and down – a bad combination. I am glad we taped the notebook to the table, but I am not sure if the hard disk will survive the steady hammering of the waves against the boat.
ZENON: Things are going upside down. Now I know what my CE version has to endure. I think I'd rather stay with the IPCs – that are more comfortable. Did Markus notice me? He obviously cares as he is trying to protect me from some of the more violent crashes by cushioning me with his hands.

▸11:00 p.m.
REINHARD: I am back at the rudder. The night is just starting and the weather is not calming down. The waves are turning into a real problem. The storm has been going on for hours now and the waves are getting bigger and bigger. In the dark night, they suddenly appear out of nowhere, like a black wall – and of course, they are all coming towards the bow.
MARKUS: I just wrapped myself around the navigation table. Going from 15 to 0 km/h in half a second without seat belts is a really stunning experience! I hear only loud creaking noises from the rudder.

▸11:01 p.m.
REINHARD: Free fall à la Reini. I noticed the last wave too late. That means: upwards in a 45° angle, over the crest of the wave with too much speed, free fall with 8 tons of boat – and then down again. Oh no! I cannot take the next wave! I ram the boat right into it. The people in the front bunk now have a true submarine view.



The water fills the deck and runs into the cockpit. My boots are filled to the top with water. I quickly look around and check if anything has happened to the boat; thank goodness, the old lady survived it well. But I must not make that mistake again. Next time, something is going to break and the last thing we need is a broken mast now. Using the life raft in this weather is not an option.

▸0:12 a.m.
MARKUS: The swell is taking its toll. My stomach is alright, but my disturbed sense of balance blurs my view. The monitor is turning more and more into a grey surface. Are my eyes deceiving me? 180 degrees shift in direction without turning ?
REINHARD: Another sudden wind change. We are now heading North-North-West, but we should be heading South-East. I wonder if the wind is going to turn even more.

▸0:18 a.m.
MARKUS: We just received the command from above: prepare for tacking, after all, we want to go South. That means into the oilskins and out into the night.

Monday, October 22

▸2007, 1:00 a.m.
REINHARD: Finally, steersman change. Back into the dry zone for two or three hours. A quick look at the laptop: we are moving forward only slowly. With all the wind and waves, it's really hard to make way. Our hopes rest at the Fingers of the Peloponnese; once we have passed them, things should get better. But they lie about 12 to 14 hours ahead. I hope the boat doesn't fail us and that Roman and I will have enough strength left until then. Maybe that's enough time for one of the others to recover.

▸2:00 a.m.
MARKUS: Again, I went to the bridge. It's really annoying to take all my clothes on and off every time I go and check the course on the laptop. But the air on deck is definitely better than down there.

▸2:41 a.m.
MARKUS: Got a new strategy. Instead of sitting on deck in my full oilskins, I just stay in the companion way. That way, I only need a cap. Haha, I outsmarted the weather!

▸2:43 a.m.
MARKUS: Thanks a lot, Reinhard. I just ask myself whether I see a nervous expression or a big grin on his face? Anyway, I am soaked to the skin and I probably will have to use my oilskin again. If only he had shouted "Wave!" a bit earlier, then I wouldn't have to change my clothes now.

▸5:03 a.m.
REINHARD: The sun is coming up, it starts to get warmer and dryer. We are just turning around the southern tip of Greece. Massive waves hit us from the side, at least 7 to 8 meters high. We see only the tip of the other boat's mast. Steering the boat is getting really exciting: one error – and we will lie flat on the water. Many ships have sunk because of such an error. We work with utmost concentration, despite a night without sleep.

▸6:24 a.m.
MARKUS: I have to take over the rudder because Roman is sleeping and Reinhard just can't go on. Big, rolling waves and a 38 knot wind from the side; difficult sailing.
As a rookie, I am really glad now that I have some experienced people around me. This way, it's actually fun to steer the boat. I am not tired, although I haven't slept. Hey, there are other boats in our vicinity. A bit further away, I can see the Devil's Bay. I wouldn't want to be there right now. The waves are smashing against the jagged cliffs.

▸7:30 a.m., south of the Peloponnese
REINHARD: We have nearly made it; just a few more miles around the Peloponnese and it will be much quieter then. Unbelievable. The ship has survived it all. It stood the test of the storm and keeps carrying us towards our destination. We can now think of our competitors again.
How are they, and have they also survived the storm? Where are we in the ranking, were we able to stay in the lead? If we have the time to think about such questions, then the worst is really over. The team is also recovering now; I have just looked into pale faces that I hadn't seen for nearly 18 hours. That lifts my spirits. Let's start the last stage.

▸8:00 a.m.
MARKUS: Eight hours and we will have passed the Peloponnese; it should be easier then.

▸3:30 p.m.
REINHARD: We made it! Now the waves and the wind are coming from astern. Time to butterfly…

▸4:14 p.m.
MARKUS: 15 minutes ago, our jib halyard snapped and our Genoa fell into the water in 35 knots of wind. Who would have thought that such a strong steel cable could snap? Roman has an idea: we will try to lift the Genoa back up with a halyard. Not an easy task with so much wind and high waves. Roman, Reinhard and I work hard to get the 60 m² sail back into position. The question is now: will the halyard withstand the pressure?

Tuesday, October 23

▸8:10 a.m., Cyclades
MARKUS: That's how I like it! Speed record! 14.6 knots ground speed, according to the GPS. Ha, I am the best.

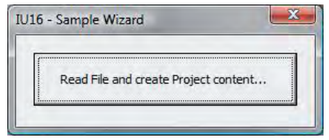
▸8:40 a.m.
REINHARD: The GPS tells me: 15.3 knots ground speed. New record!

▸09:52 p.m., port of Pythagoreion, Island of Samos, Greece We have reached our destination, and we are one of the first boats. We jump for joy. We already thought so, but we are sure only after we see the official results a few days later; we managed to rank first in our group – over 31 hours ahead of the runner-up!

In the overall standings, we ranked 12th against a total of 96 participants. In the blue ribbon ranking – which takes the sailing time without considering the boat-specific yardstick number – we ranked 16th. Despite our old ship. A remarkable achievement. Oh yes, and we also won an unofficial title: the crew with the most stylish outfit.
ZENON: Most stylish outfit? Must be my influence… I also got myself a new one!
Reinhard Mayr, Markus Stangl

Automatic Engineering

Project Wizard with file import from DB or file



In the last three issues of Information Unlimited, you learned about automatic engineering. You learned how to define standards and how to reuse existing project parts. In the third part, we showed you all about automatic engineering with Excel. Here, in the last part, you will learn how to generate projects with Wizards. Our Wizard will read the necessary information from a text file (CSV format). Of course, you could also read this project information from a database. However, that would require more VBA code – for SQL connections and queries.

To start the Wizard, we have a "UserForm" consisting of only one button. After pressing the button, zenon reads the text file, analyzes the contents and generates all the project parts.
The downside of using a text file is that links between functions, pictures and variables etc. are not as transparent and clearly structured as they would be in a database.

Definition of the templates: `TMP;MAIN;0;0;1280;950`	TMP = ID of the template MAIN = name of the template 0;0;1280;950 = size + position
Definition of the variables: `VAR;Var1;Intern;UINT;33`	VAR = ID of the variable Var1 = name of the variable Intern = driver name UINT = data type 33 = object type (internal variable)
Definition of pictures: `PIC;START;MAIN;0`	PIC = ID of the picture START = name of the picture MAIN = template to be used 0 = picture type (standard)
Definition of the functions: `FCT;ShowStart;3;START`	FCT = ID of the function ShowStart = name of the function 3 = function type (picture switch) START = parameter (picture to be loaded)
Definition of the elements: `ELE;START;numVar1;1;Var1;100;100;200;150`	ELE = ID of the element START = name of the picture numVar1 = name of the element 1 = element type (numerical value) Var1 = parameter (linked variable) 100;100;200;150 = size + position
Definition of the scripts: `SCR;AUTOSTART;ShowStart|ShowButtons`	SCR = ID of the script AUTOSTART = name of the script ShowStart|ShowButtons = script functions

In order to create a complete project, several entries of the different project parts in the text file are required. This structure can be expanded as desired.

READING AND ANALYZING THE TEXT FILE

The text file is read out as described in the following script. Based on the ID at the start of every line, the corresponding object is created or – if it already exists – modified.

```
Option Explicit
'*************************************************************************
'* Constant file path...                                                 *
Const cFile As String = "C:\Users\Robert\Documents\IU16\sample_data.txt"
'*************************************************************************

'*************************************************************************
'* Event is fired when the button of the userform is clicked...          *
'*************************************************************************
Private Sub cmdReadFile_Click()

Dim FSO As FileSystemObject
Dim mTS As TextStream
Dim vLine As Variant

  Set FSO = New Scripting.FileSystemObject
  'check if file exists
  If FSO.FileExists(cFile) = False Then
    MsgBox "File not Found: " & cFile, vbCritical
    Exit Sub
  End If
  'read textfile
  Set mTS = FSO.OpenTextFile(cFile)
  Do Until mTS.AtEndOfStream
    'split parameters of actual line
    vLine = Split(mTS.ReadLine, ";")
    Select Case vLine(0)
      Case "TMP"  'Templates
        Call CreateTemplate(CStr(vLine(1)), CInt(vLine(2)), CInt(vLine(3)), _
                            CInt(vLine(4)), CInt(vLine(5)))
      Case "VAR"  'Variables
        Call CreateVariable(CStr(vLine(1)), CStr(vLine(2)), CStr(vLine(3)), _
                            CInt(vLine(4)))
      Case "PIC"  'Pictures
        Call CreatePicture(CStr(vLine(1)), CStr(vLine(2)), CInt(vLine(3)))
      Case "FCT"  'Functions
        Call CreateFunction(CStr(vLine(1)), CInt(vLine(2)), CStr(vLine(3)))
      Case "ELE"  'Elements
        Call CreateElements(CStr(vLine(1)), CStr(vLine(2)), CInt(vLine(3)), _
                            CStr(vLine(4)), CInt(vLine(5)), CInt(vLine(6)), _
                            CInt(vLine(7)), CInt(vLine(8)))
      Case "SCR"  'Scripts
        Call CreateScript(CStr(vLine(1)), CStr(vLine(2)))
    End Select
  Loop

  mTS.Close
  MsgBox "Finished", vbInformation
  MyWorkspace.ActiveDocument.Build (tpIncremental)
  Unload Me

End Sub
```

As you can see in this procedure, the parameters are passed over to pre-defined procedures that are executed according to the ID in the text file. In each of these procedures, the relative object is then created or modified.

THE CREATETEMPLATE ROUTINE

```
'*************************************************************************
'* Procedure to create a new Template or change an already existing.    *
'*************************************************************************
Sub CreateTemplate(sName As String, nLeft As Integer, nTop As Integer, _
                   nRight As Integer, nBottom As Integer)

Dim zTmp As Template

  'create template if not existing
  Set zTmp = MyWorkspace.ActiveDocument.Templates.Item(sName)
  If zTmp Is Nothing Then
    Set zTmp = MyWorkspace.ActiveDocument.Templates.Create(sName, True)
  End If
  'change template properties
  With zTmp
    .Left = nLeft
    .Top = nTop
    .Right = nRight
    .Bottom = nBottom
  End With
End Sub
```

A new template is created provided there isn't already a template with that name in the project. After this, the template is configured according to the contents of the text file.

THE CREATEVARIABLE ROUTINE

```
'*************************************************************************
'* Procedure to create a new Variable or change an already existing.    *
'*************************************************************************
Sub CreateVariable(sName As String, sDriver As String, sVarType As String, _
                   nDataType As Integer)

Dim zDriver As Driver
Dim zVarType As VarType
Dim zVAR As Variable
Dim i As Integer

  'get Driver
  For i = 0 To MyWorkspace.ActiveDocument.Drivers.Count - 1
    Set zDriver = MyWorkspace.ActiveDocument.Drivers.Item(i)
    If zDriver.Driver = sDriver Then
      Exit For
    Else
      Set zDriver = Nothing
    End If
  Next i
  If zDriver Is Nothing Then Exit Sub
  'get VarType
  Set zVarType = MyWorkspace.ActiveDocument.VarTypes.Item(sVarType)
  If zVarType Is Nothing Then Exit Sub
  'create variable if not existing
  Set zVAR = MyWorkspace.ActiveDocument.Variables.Item(sName)
  If zVAR Is Nothing Then
    Set zVAR = MyWorkspace.ActiveDocument.Variables.CreateVar _
               (sName, zDriver, nDataType, zVarType)
  End If
  'change variable properties
  With zVAR
    .Tagname = "created by VBA - " & Now
  End With

End Sub
```


Just like templates, a new variable is only created if it doesn't already exist. If it does, then it will only be modified and therefore adapted to the specifications in the text file.

THE CREATEPICTURE ROUTINE

```
'*************************************************************************
'* Procedure to create a new Picture or change an already existing.     *
'*************************************************************************
Sub CreatePicture(sName As String, sTemplate As String, nType As Integer)

Dim zPIC As DynPicture
  'create picture if not existing
  Set zPIC = MyWorkspace.ActiveDocument.DynPictures.Item(sName)
  If zPIC Is Nothing Then
    Set zPIC = MyWorkspace.ActiveDocument.DynPictures.Create _
               (sName, sTemplate, nType)
  End If
  'change picture properties
  With zPIC
    .BackColor = RGB(Rnd(1) * 255, Rnd(1) * 255, Rnd(1) * 255)
  End With

End Sub
```

To make it easer to recognize changes during testing, the picture has a random background color when it is created or modified. This is done only to provide a better overview.

THE CREATEFUNCTION ROUTINE

```
'*************************************************************************
'* Procedure to create a new Function or change an already existing.    *
'*************************************************************************
Sub CreateFunction(sName As String, nType As Integer, sParameter As String)

Dim zFCT As RtFunction

  'create function if not existing
  Set zFCT = MyWorkspace.ActiveDocument.RtFunctions.Item(sName)
  If zFCT Is Nothing Then
    Set zFCT = MyWorkspace.ActiveDocument.RtFunctions.Create(sName, nType)
  End If
  'change function properties
  With zFCT
    Select Case nType
      Case 3    'Picture Switch
        .DynProperties("Picture") = sParameter
      Case 12   'Exit Program
        'no parameters needed
    End Select
  End With

End Sub
```

Depending on the function type, different parameters are required. That is why there is a “Select – Case” statement that behaves according to the parameters.

THE *CREATEELEMENTS* ROUTINE

```
'*************************************************************************
'* Procedure to create a new Element or change an already existing.     *
'*************************************************************************
Sub CreateElements(sPicture As String, sName As String, nType As Integer, _
                   sParameter As String, nLeft As Integer, nTop As Integer, _
                   nRight As Integer, nBottom As Integer)

Dim zPIC As DynPicture
Dim ZELE As Element
Dim zVAR As Variable
Dim zFCT As RtFunction

  'get picture object
  Set zPIC = MyWorkspace.ActiveDocument.DynPictures.Item(sPicture)
  If zPIC Is Nothing Then Exit Sub
  'create element if not existing
  Set ZELE = zPIC.Elements.Item(sName)
  If ZELE Is Nothing Then
    Set ZELE = zPIC.Elements.Create(sName, nType)
  End If
  'change element properties
  With ZELE
    .BackColor = RGB(Rnd(1) * 255, Rnd(1) * 255, Rnd(1) * 255)
    .ForeColor = RGB(Rnd(1) * 255, Rnd(1) * 255, Rnd(1) * 255)
    .Left = nLeft
    .Top = nTop
    .Width = nRight - nLeft
    .Height = nBottom - nTop
    Select Case nType
      Case 10   'Text Button
        .DynProperties("Function") = sParameter
        .DynProperties("Text1") = sParameter
      Case 1    'Numerical Value
        Set zVAR = MyWorkspace.ActiveDocument.Variables.Item(sParameter)
        If Not zVAR Is Nothing Then
          .AddVariable zVAR
        End If
    End Select
  End With
  zPIC.Save 'save changes

End Sub
```

Again, this procedure behaves in different ways, this time according to the element type. A text button is linked to a function. The numerical value element, however, is only linked to a variable. Both parameters are passed to the procedure as Strings.

THE *CREATESCRIPT* ROUTINE

```
'*************************************************************************
'* Procedure to create a new Script or change an already existing.      *
'*************************************************************************
Sub CreateScript(sName As String, sParameter As String)

Dim zSCR As Script
Dim zFCT As RtFunction
Dim i As Integer
Dim vParam As Variant
  'enumerate scripts
  For i = 0 To MyWorkspace.ActiveDocument.Scripts.Count - 1
    Set zSCR = MyWorkspace.ActiveDocument.Scripts.Item(i)
    If zSCR.Name = sName Then
      Exit For
    Else
      Set zSCR = Nothing
    End If
  Next i
  'create script if not existing
  If zSCR Is Nothing Then
    Set zSCR = MyWorkspace.ActiveDocument.Scripts.Create(sName)
  End If
  'add functions to script
  vParam = Split(sParameter, "|")
  For i = 0 To UBound(vParam)
    Set zFCT = MyWorkspace.ActiveDocument.RtFunctions.Item(CStr(vParam(i)))
    If Not zFCT Is Nothing Then
      If HasScriptFunction(zSCR, zFCT) = False Then zSCR.Add zFCT.ID
    End If
  Next i

End Sub
```

This procedure is executed to create a script AND to add functions to it. To make sure that the same function is not added to a script more than once, a check is required. The pre-defined function “HasScriptFunction” does just that.

THE FUNCTION *HASSCRIPTFUNCTION*

```
'*************************************************************************
'* Function to check if the given zenon function has already been added.*
'*************************************************************************
Function HasScriptFunction(zSCR As Script, zFCT As RtFunction) As Boolean

Dim i As Integer

  For i = 0 To zSCR.Count - 1
    If zSCR.Item(i).ID = zFCT.ID Then
      HasScriptFunction = True
      Exit Function
    Else
      HasScriptFunction = False
    End If
  Next i

End Function
```

All functions of the script are searched. If the function already exists, the function returns “True”. This function uses the function ID (zenon internal database ID) to perform this check.
If you want to create your own Wizard, you can also download this example in the VBA section of the forum on the COPA-DATA website: www.copadata.com/Forums. *Robert Ficker*