

01 | 2024

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Cooperative engineering with Engineering Base

AT THE HEART OF A PLANT'S ENTIRE LIFE

THE POTENTIAL IS REAL
AI and engineering

**ENGINEERING BASE PROVIDES
THE DIGITAL FOUNDATIONS**
Partnership for more green hydrogen

IT'S BASED ON TRUST
"Premier class" ISO 27001

AUCOTEC
will be there!

ACHEMA 2024

June 10 – 14
2024



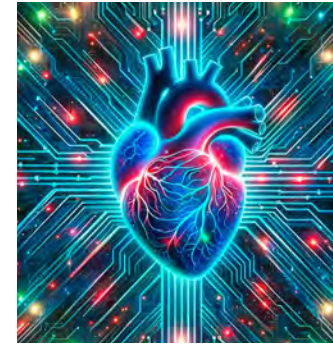
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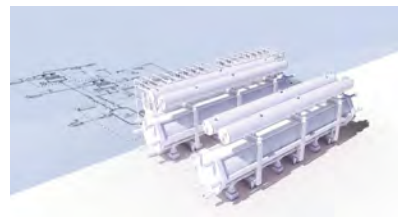
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Dear Reader,

Data is the currency of the future. You will probably have heard that suggestion many times before, but it is more relevant now than ever. Making the digital transformation a reality in industry requires data-centric and holistic solutions that model and explore complete process chains and working environments, and pave the way into a sustainable future.

Our cooperative platform Engineering Base is one such solution, as you will see in this edition of unite. It's for good reason that we refer to it as the "heart" in plant engineering.

I hope you enjoy the read.

And don't forget: you can meet us and our "heart" in person at ACHEMA 2024. We look forward to seeing you there.

Uwe Vogt
 Board Member



> Dr. Pouria Bigvand

AI and engineering

THE POTENTIAL IS REAL

As well as revolutionizing how we deal with text and images, artificial intelligence (AI) also holds the potential to optimize engineering processes. Dr. Pouria Bigvand, Director of Product Management and Research & Development at AUCOTEC, explains how AI can assist with engineering of production plants. This is an area that he researched in his PhD thesis many years ago – and his focus on it has remained undimmed.

Since the hype surrounding ChatGPT at the end of 2022, AI Tools no longer just used by a small group of engineers but by the broad masses. Consequently, the opportunities offered by AI become even more visible – also for companies. This, of course, could be achieved by the application of generative AI, specifically the development of large language models (LLMs) on the basis of the almost unlimited amount of training data on the open internet. However, experts agree that generative AI is just a smaller subset of AI and in some specific fields the availability of training data is not as broad as published texts on the internet. In these fields, supervised machine learning (ML) is a strong approach parallel to LLMs.

QUANTITY AND QUALITY?

On this basis, says Bigvand, there are some use cases in engineering of production plants that can significantly benefit from usage of AI. To name a few:

- > auto generation of data models and diagrams by LLMs, i.e. automatic generation of a data model of a component such as a heat exchanger without any predefined rules
- > auto correction of data models and diagrams, i.e. suggestions for corrections to the data model based on similar tokens found by LLMs
- > HAZOP, i.e. identification of constellations that can be considered hazardous based on supervised ML models
- > migration of legacy documents using computer vision and ML models.

TURNING PDFs INTO DIGITAL TWINS

AI can also learn to “understand” diagrams. This means it can be trained to classify illustrated components in PDF or PNG files. AUCOTEC is tapping into this area of application to provide a unique form of support for projects seeking to migrate as-built plant documentation to the data-driven Engineering Base software. The aim here is to migrate all diagram types from process, I&C, electrical and hydraulics in non-machine-readable forms such as PNG or PDF and generate a data model in parallel to PDF files with hot spots for navigation purposes. “Having said that,” continues Bigvand, “experienced experts are still needed to carry out reviews and improve the AI model. Several rounds of corrections and fine tunings are required per data set.”

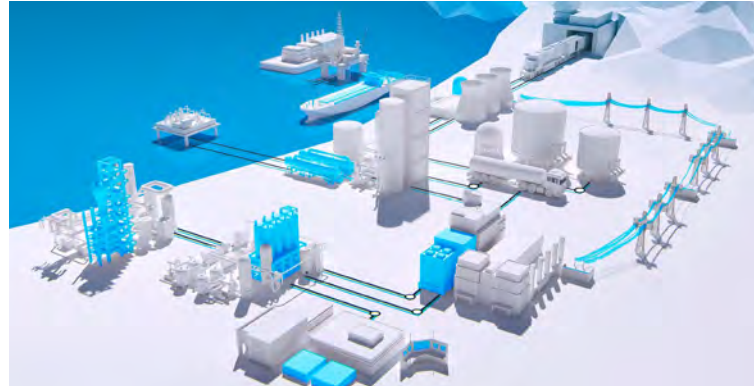
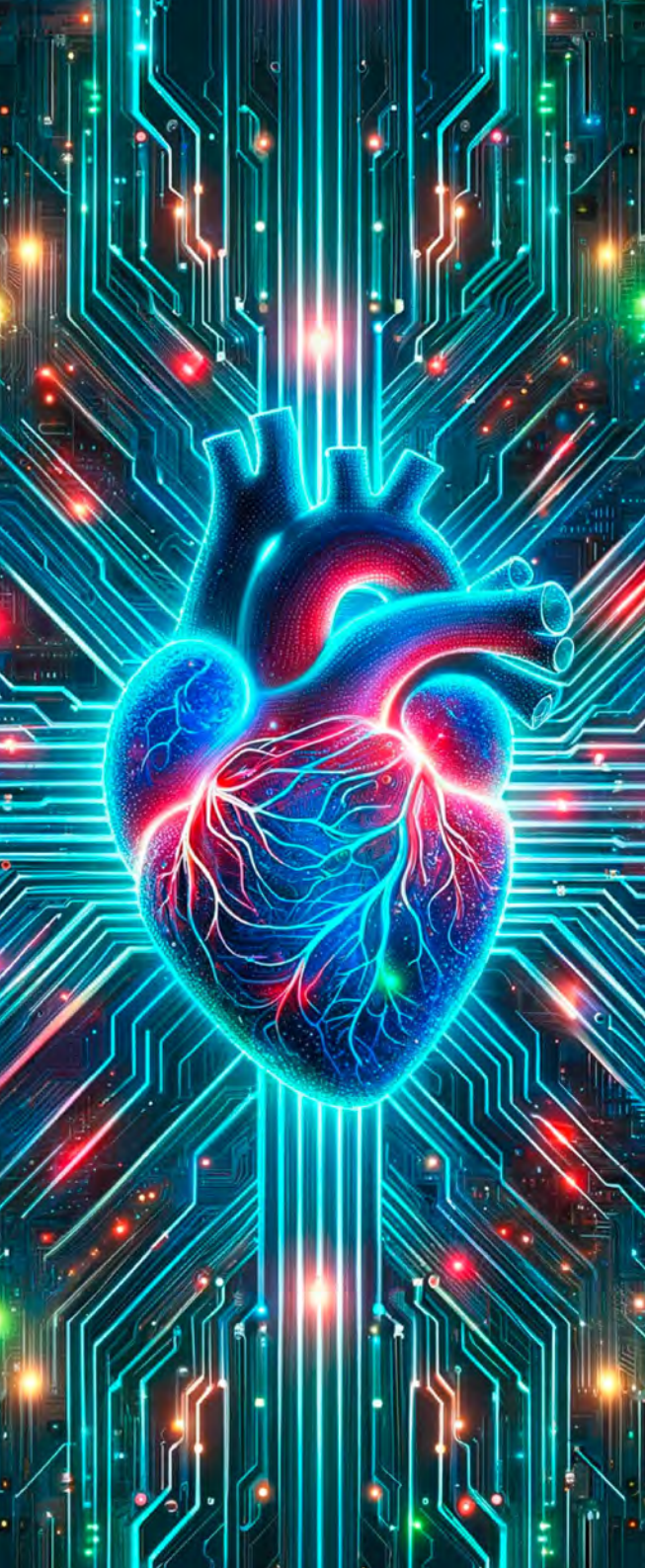
The training is worth all the effort, as it will then be possible to create object models very efficiently from the plant documentation, which is decades old. Doing so will greatly facilitate maintenance and revamp work. “Although much of this is already possible for machine-readable formats such as DWG in Engineering Base, AI will bring new life to documents that have long been considered dead,” says Bigvand.

MORE THAN JUST SEARCHING

At present, when engineering tool providers talk about their tool’s AI features, they are usually just referring to an advanced search function that is able to process large amounts of text and provide reasonable answers, lists or components. However, we at AUCOTEC believe AI is capable of much more in the world of plant and machine engineering when “structured” data is available and on a large scale. Plus, as Bigvand says: “Being able to capitalize on the capabilities of AI will be crucial if you are going to stay competitive.”

Engineering Base would appear to fit the bill perfectly here: open for integration, data centric across different disciplines, and exceptionally consistent and transparent too.





Cooperative engineering with Engineering Base

AT THE HEART OF A PLANT'S ENTIRE LIFE

Digitalization still poses a challenge for everyone – the process industry included. Companies frequently have to contend with inadequate IT systems and disjointed software landscapes. Any chance of process transparency and a consistent flow of information is lost as a result, making it increasingly difficult to stay competitive internationally. That might sound overly negative, but it is also the message from one study and survey after another. Thankfully, wherever there is a challenge, there are also enablers to provide a solution – in this particular case, the software specialists from AUCOTEC. The company has been a constant source of pioneering engineering software solutions for nearly 40 years now, including solutions for the process industry.

Cover story

The cooperation platform Engineering Base from AUCOTEC is a prime example of a holistic approach, something that is becoming crucial in process plants. The exchange of data and information is of key importance for digitalization of plants and processes. It must be efficient, secure and perfectly clear, with the goal of bringing greater transparency to the increasing complexity of tasks, team structures, general conditions, specifications and guidelines. This is the only way to make the right business decisions, increase productivity and efficiency, and meet sustainability targets. AUCOTEC is redefining this cooperative engineering in the process industry with its software platform. “We create the link between company processes through a unique, data-centric cooperation platform,” explains AUCOTEC Board Member Uwe Vogt. “Engineering Base is designed for the entire life of the plant, meaning it ultimately becomes the heart of the process industry and plant engineering.”

THE SINGLE SOURCE OF TRUTH

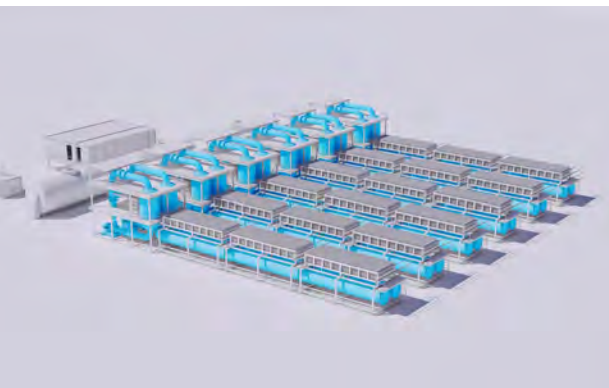
AUCOTEC is demonstrating how plants and the various engineering disciplines can be connected with one another efficiently and work together to optimum effect with Engineering Base as the key component. Merged plant and process data improves control, maintenance and production quality here. “Our software platform ensures data consistency at all times thanks to interdisciplinary engineering using a shared, object-oriented database – the single source of truth,” explains Henry Bloch, Head of Product Management at AUCOTEC.

After all, as soon as multiple engineers start to work together cooperatively, the object history of valves, pumps, piping and all process-controlled electrical devices becomes extremely important. "Change management that ensures complete transparency throughout the project plays a major role here, for example," continues Bloch. "This helps our customers to minimize errors and improve the quality of data and the associated documentation." In Engineering Base, plant changes within the data model and all associated diagrams and documents can always be tracked – with revision management too.

The cooperation platform also enables modular engineering with interdisciplinary typicals and variant management, which is particularly crucial for hydrogen plants.

THE HOPE OF GREEN HYDROGEN

It's no secret that the international hydrogen market still lacks sufficient electrolysis capacity for the required quantities of hydrogen.



Governments and businesses are working on solutions. And AUCOTEC is also assisting electrolyzer manufacturers in increasing their capacities faster and producing green hydrogen on a large scale. The focus here is on scalable engineering processes for shorter project durations. The key elements of engineering in this regard are data centrality, standardization and modularization. For more about this, read the article on AUCOTEC's collaboration with Sunfire on page 6.

DATA EXCHANGE – YOU'LL GET NOWHERE WITHOUT IT

Digital data exchange for integrated engineering is another area of focus for AUCOTEC. The value of data is, after all, becoming increasingly clear for all stakeholders in the process industry. The volume of data in the various planning phases of a plant is growing all the time. In order to now leverage maximum value from the Engineering Base plant data, standardized information models and data exchange formats have been implemented, such as IEC 81346, IEC 61850, DEXPI, CFIHOS, OPC UA, Jip 33, AML and EBML.

"Engineering Base opens up a unique combination of the advantages of a highly standardized product world and the particular requirements of plant engineering," says Vogt. "In this way, we are guaranteeing efficient and sustainable processes and business models in the industry – and beyond."



"Engineering Base is already a success story in the world of process plants – and this story has a long way still to run."

Uwe Vogt, Board Member of AUCOTEC



"Data consistency at all times thanks to interdisciplinary engineering using a shared, object-oriented database – the single source of truth: that's what Engineering Base stands for."

Henry Bloch, Head of Product Management at AUCOTEC



© Sunfire GmbH

> Dr. Wolfgang Staroske

Partnership for more green hydrogen

ENGINEERING BASE PROVIDES THE DIGITAL FOUNDATIONS

“Green hydrogen is the missing piece of the energy transition puzzle. We will only meet our climate goals with green hydrogen, while giving our economy a boost at the same time” – that is the message from Germany’s Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV). And it is why Germany is seeking to ramp up electrolysis capacity to at least 10 gigawatts by 2030. That would cover 20 to 30 percent of Germany’s hydrogen requirements according to the BMUV. Partnerships such as the one between hydrogen specialist Sunfire and AUCOTEC are helping to reach this goal.

The growing demand for electrolysis capacity is no secret. Technology leaders in the field of hydrogen, such as the company Sunfire, are in the front line when it comes to tackling this challenge. And the AUCOTEC software platform Engineering Base is set to play a key role here. It places the focus on optimized and scalable engineering processes for shorter project durations. “For us, the object-oriented data model of Engineering Base forms the foundation for significantly more efficient and agile plant development as well as for clearly structured modular engineering,” emphasizes Dr. Wolfgang Staroske, Director of Project Engineering at Sunfire. “The cooperation platform enables all engineering disciplines to work together collaboratively and simultaneously, with every change or addition immediately visible and traceable for everyone involved.”

With Engineering Base, Sunfire can not only standardize its software landscape, but also significantly reduce susceptibility to errors thanks to consistent data and automatic change management. The ability of Engineering Base to modularize across different disciplines is of particular interest to Sunfire.

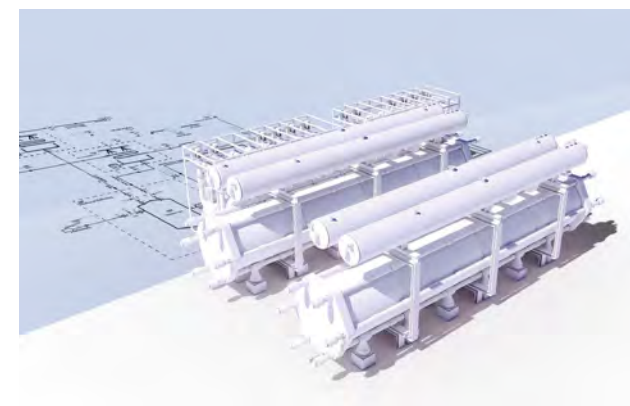
The collaboration is also an important affirmation for AUCOTEC. “Here once again, Engineering Base is synonymous with greater process efficiency,” explains Uwe Vogt, Board Member of AUCOTEC. “We are particularly

delighted that it has won over this innovative company in such a promising, sustainability-focused technology sector.”

Sunfire was highly impressed by the package as a whole, as Engineering Base fulfilled all the most important requirements: complete object orientation, crystal-clear navigation options and better electrical and process engineering functions. “For the latter aspect, we spent a long time exploring the market, and it was Engineering Base that finally convinced us,” adds Staroske.

„The partnership with AUCOTEC will help to produce green hydrogen on a large scale and promote profitable business models for an increasingly sustainable world.“

Dr. Wolfgang Staroske
Director of Project Engineering at Sunfire





> Norman Hanke

“Premier class” ISO 27001

IT'S BASED ON TRUST

The highest standards of IT Security and data protection: It has been official since the end of 2023: AUCOTEC is ISO 27001 certified. Our Head of Operations Management, Norman Hanke, explains why this is so important for us and our customers and why we can rightly be proud of it.

Why is ISO 27001 so important for AUCOTEC?

Hanke: Quite simply, it is an important milestone in our efforts to continuously ensure the highest standards in information security and data protection. Information security is an extremely important topic, especially in a software company like ours that also operates globally.

How did you go about the certification process?

Hanke: We analyzed in detail all information processing operations across our company's departments and identified the critical points. We did this systematically and in a risk-oriented manner and took additional measures in relevant areas where necessary. At the same time, we designed our own information security management system (ISMS).

What advantages does the certificate have for our customers – and us?

Hanke: The basis of good business relationships is trust. The ISO 27001 certificate is a kind of seal of approval. It underlines that our customers can rely on us to take the issue seriously and protect their confidential data.

In addition, more and more customers require this standard, which most companies in our industry and of our size simply do not have. ISO 27001 is considered the “premier class” among internationally recognized standards and is one of the most complex of its kind.



Does the certificate have to be regularly re-issued?

Hanke: Absolutely. This certificate is also a kind of driving license, which means you can also lose it. The certificate is initially only valid for three years. It is continually checked and re-issued. So there's no such thing as standing still! We deal with information and data security every day and are constantly improving our performance.

And we shouldn't forget that we are manufacturing – to an extent, at least – process-critical software or a central component in an often complex system. ISO certification is particularly crucial for customers with critical infrastructure. We therefore have to perform at a high level here. This standard plays an important role for our future and our business strategy because it opens doors to new markets.

"For many years now, AUCOTEC – and our software platform Engineering Base, in particular – have represented a remarkable success story in the process industry. Engineering Base provides a strong basis for process and production environments worldwide, especially when efficiency, transparency and agility are the goals."

Stefan Wedderkopp, Global Sales Director Process Plants



"Engineering Base is able to significantly reduce project times and in so doing accelerate the market ramp-up of hydrogen. We have the solutions and the know-how to assist electrolyzer manufacturers in increasing their capacities faster and producing green hydrogen on a large scale."

Niclas Meier, Global Account Manager



"How do we support EPCs on the path to digitalization? By offering an all-encompassing solution which faces up to the sector's key challenges; one that minimizes risks, reduces delays and eliminates the need for reworking. Engineering Base puts companies in a position where they can realize their full potential."

Gertjan Edelijn, General Manager of AUCOTEC Netherlands B.V.



"Whether AutomationML, DEXPI or CFIHOS, to name just a few of the most promising formats – Engineering Base provides the necessary data with minimal effort and creates connections, instead of trapping it in another data silo."

Leon Hanke, Product Manager Plant Automation



"As a multidisciplinary and cross-departmental engineering platform, Engineering Base is designed not only to provide up-to-date data at all times, but also to identify changes immediately. This enables data tracking in the overall model and a history at object level that provides full transparency."

Florian Hanka, Director Application Consulting and Business Development

"With Engineering Base, we are offering a software platform for plant engineering which our customers can depend on at all times. One which models all the disciplines and phases of the overall project."

Anders Hoie, Key Account Manager

