



Higher customer satisfaction through digital service management

ALMiG uses the IoT product Modbus Cloud Connect from Vodafone and grandcentrix to digitalise its compressed air systems.



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Together we can

ALMiG, a manufacturer specialising in the production and treatment of compressed air, uses Modbus Cloud Connect from Vodafone and grandcentrix for the IoT connection of its machines.

Networking the compressors with the cloud enables extensive applications ranging from status monitoring and asset management to the analysis and visualisation of machine use and capacity utilisation through to predictive maintenance.

Compressed air systems with a long tradition

ALMiG stands for Automatic Air Pumps - Made in Germany. The company of the same name is one of the leading system providers in compressed air technology. Its headquarters in Köngen, Baden-Württemberg, have been in existence since the year 1923, a small workshop for the production of car air pumps for inflating car and truck tires was founded on the same site. Over the decades, the company has continually adapted its product range to meet contemporary needs. This led, for example, to the development of industrial compressors, lifting platforms and paint spray guns.

Following a change of ownership, the newly founded ALMiG Kompressoren GmbH commenced operations in 2007 and has been part of the globally active Taiwanese Fusheng Group since 2012. This also strengthened the company's global sales network in the long term. Today, the ALMiG Group employs around 250 people at its site in Köngen and continues to produce almost all of its compressors in Germany. The company's product range includes customized systems of all kinds for the generation and treatment

of compressed air. These high-quality compressed air systems are used in practically all industries worldwide.

ALMiG increases the productivity of its customers with innovative and customized products and comprehensive services. Efficiency and sustainability are already among the company's guiding principles - the products are constantly being further developed in order to reduce the energy consumption of the compressors. An important tool for this is the networking of the systems.

ALMiG was already offering its customers remote monitoring functions for its compressors via fixed network or cellular modems at the end of the 1990s. Since then, the ALMiG developers have tested various solutions for connecting their products to the network and finally decided to use the LPWA network technologies Narrowband IoT and LTEM. "So it was obvious for us to go straight to the 'source' - namely one of the global IoT market leaders," reports Ralph Jeschabek, Head of Marketing at ALMiG Kompressoren GmbH. The company therefore decided to work with Vodafone and its IoT subsidiary grandcentrix for its IoT solutions.



ALMiG offers a wide range of compressed air systems for practically all industries worldwide.

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"Vodafone and grandcentrix provide us with everything we need for the IoT capability of our products from a single source: hardware, connectivity, data service and support. We appreciate the close and trusting cooperation and the high level of IoT expertise. This in turn enables us to increase our customers' satisfaction with new digital services."

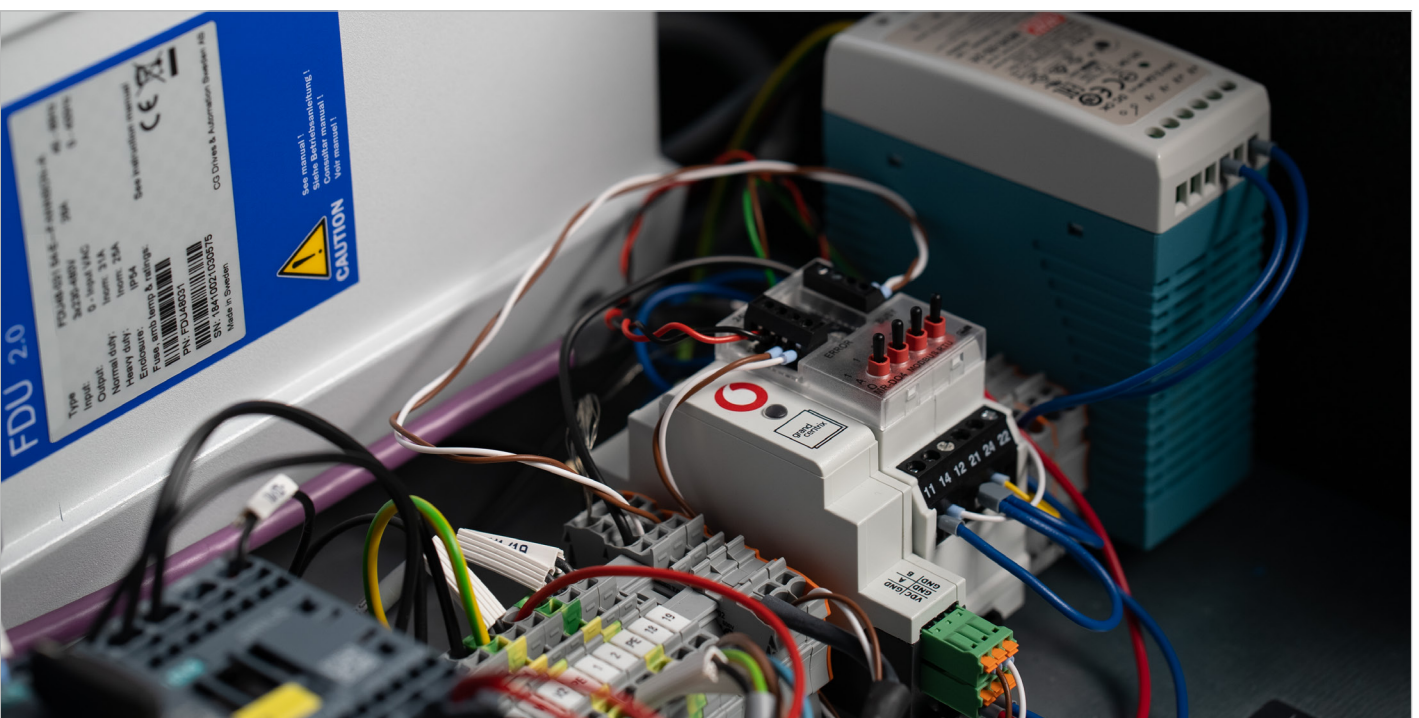
Ralph Jeschabek, Head of Marketing ALMiG Kompressoren GmbH

Digital service management through the use of IoT and cloud services

"Modbus Cloud Connect has clearly proven to be the most suitable solution for our purposes," emphasizes Ralph Jeschabek. As compressors are often installed in machine rooms or basements, the LPWA (LowPower Wide Area) Narrow bandIoT and LTEM technologies used for data transmission, which can send and receive signals even through thick walls or other obstacles, have proven particularly useful. "The slim form factor and the ability to use our existing top-hat rails were also helpful for us, allowing us to offer an IoT upgrade for our machines." It was also crucial to be able to continue using the existing protocol for device control - namely Modbus RTU. Another factor was the simple connection of existing sensors and actuators in the products. "A cloud platform for the service is already in use at ALMiG," explains Ralph Jeschabek. "The simple and flexible data integration of the Modbus Cloud Connect gateways into our existing cloud infrastructure was therefore important."

The applications realized by ALMiG on the basis of this technology are diverse. They range from classic status monitoring and asset management to the analysis and visualization of machine usage and capacity utilization through to predictive maintenance. The data collected from the machines are aggregated in the cloud platform.

It is also the basis for the asset relationship management system introduced by ALMiG 2022 "COMPASS" (Compressed Air Service Solution). It provides end customers and partners with machine status information, parts lists and other information. Modbus Cloud Connect forms the IoT component of the COMPASS solution to provide up-to-date usage data such as operating hours, temperature or pressure. COMPASS serves as a digital plant logbook that also manages service cases, maintenance tasks and certificates, for example. Users can also monitor entire plant fleets, including downstream systems, via a dashboard. The solution thus becomes the digital life record of the ALMiG compressors it manages. These options in turn play an important role in ensuring and, if necessary, improving the energy efficiency of the machines: Late maintenance, such as missed oil filter changes, quickly leads to higher consumption in air compressors. In addition, energy saving potentials can also be derived from the machine data - such as lowering the operating temperature. It is also possible to compare consumption data with other users of the same machine type. "Vodafone and grandcentrix provide us with everything we need for the IoT capability of our products from a single source: hardware, connectivity, data service and support. We appreciate the close and trusting cooperation and the high level of IoT expertise. This in turn enables us to increase our customers' satisfaction with new digital services," confirms Jeschabek.



The Modbus Cloud Connect gateway is installed in the ALMiG products on the existing top-hat rail in the retrofit.

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Narrowband-IoT and LTE-M



The two LPWA (Low-Power Wide-Area) technologies are both based on 4G/LTE. They were developed specifically for IoT applications and offer wider and deeper network coverage at the same time. Their advantages:

- Improved building penetration and range of up to 20 dB (NB-IoT) or up to 15 dB (LTE-M)
- Long battery life (up to 10 years) thanks to extremely low energy consumption
- Connection of millions of devices (LTE-M) or several hundred thousand devices (NB-IoT) in one radio cell
- Cost-efficient implementation due to low component costs
- Good network coverage in difficult environments (e.g. basements or remote regions)
- Best possible security during data transmission thanks to end-to-end encryption in accordance with the LTE standard

More information about Narrowband IoT and LTE-M from Vodafone can be found under the QR code.



What are the advantages of the solution?

Simple installation and commissioning

- Compact, established form factor
- Simple onboarding via QR code
- Self-service portal
- Preconfigured cloud adapters

Simple, self-sufficient data communication

- Secure, regulated IoT mobile technology via NB-IoT and LTE-M for global data transmission

Simple IoT upgrade of existing devices

- Retrofit for equipping existing and new appliances independently of product development cycles

Simple and reliable operation over the service life

- Service-Desk
- Regulated FOTA updates (firmware updates over the air)
- Self-service configuration of Modbus RTU devices and the bus system



The Modbus Cloud Connect gateways support data transmission via NB-IoT and LTE-M

FIVE QUESTIONS ON DIGITALISATION

TO RALPH JESCHABEK, HEAD OF MARKETING ALMiG KOMPRESSOREN GMBH

1. **Why did you decide to take the step towards digitalization with your company and what are the specific advantages of the Modbus Cloud Connect solution?**

Jeschabek: The digitalization of our products has long been a focus for ALMiG. However, we have struggled in the past to bring IoT solutions together with several partners in a functional way.

Modbus Cloud Connect was the answer to these challenges, as the most important components are already integrated and harmonize with each other - not least because they come from a single source. The resulting IT integration of our products opens up many useful possibilities for us and our customers.

2. **In your opinion, what are the greatest opportunities arising from digitalization?**

Jeschabek: In addition to a better overview and benefits such as needs-based, predictive maintenance, I would particularly like to point out the opportunities for more sustainable and energy-efficient use of our machines. This enables us to show our customers clear savings potential, which is clearly reflected in reduced consumption costs.

3. **What are the biggest risks if a company sleeps through digitalization?**

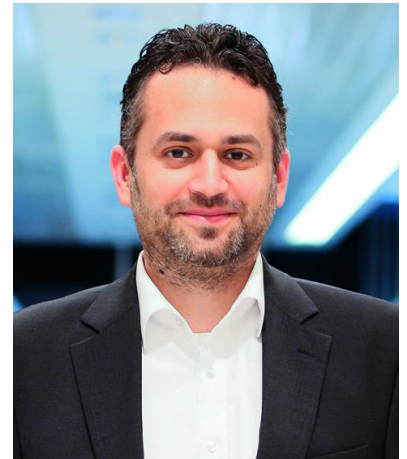
Jeschabek: The examples mentioned show that the digitalization of our products and services is an important building block in our range. I would even go so far as to say that we would no longer be fully competitive in the long term without such offerings.

4. **What advice would you give to companies that have not dealt with the topic much so far?**

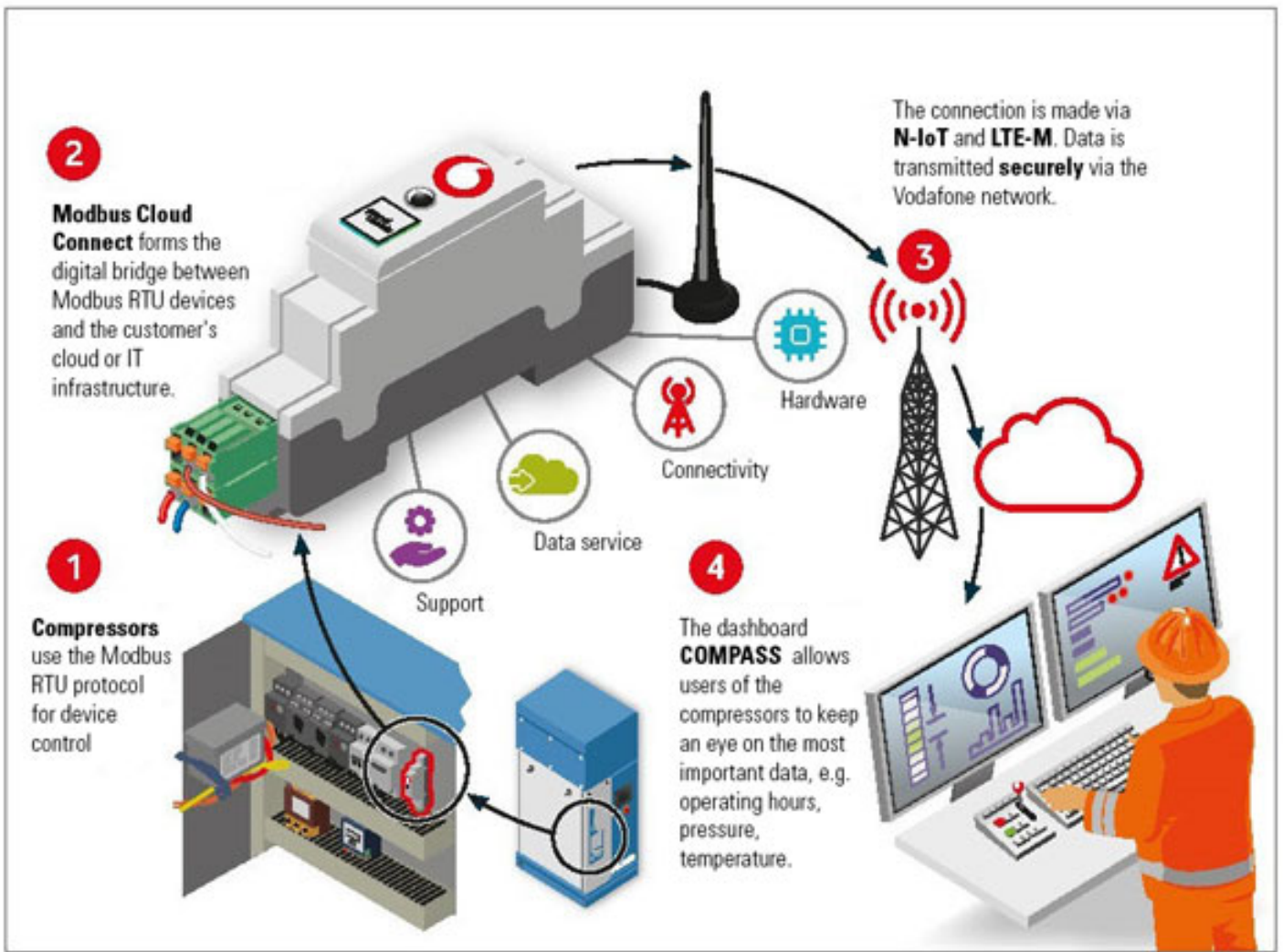
Jeschabek: Every company is probably the best judge of the potential that results from consistent digitalization or digital services. However, when implementing the corresponding solutions, it certainly makes sense to work together with competent partners.

5. **Based on the experience you have already had: What three tips would you give to a company in the same situation?**

Jeschabek: In my view, the three main steps are: firstly, needs and strategy analysis. Secondly, solution design and development. And thirdly, implementation and introduction. As I just said, step one is certainly the responsibility of each company. For steps two and three, it makes sense to work with partners who are experts in the required technologies and solutions. For us, the collaboration with Vodafone and grandcentrix was therefore ideal.



Ralph Jeschabek,
Head of Marketing
ALMiG Kompressoren GmbH



ALMiG's compressed air systems enhanced with IoT modules report operating and consumption data to the ALMiG cloud. ALMiG's asset relationship ship management system "COMPASS" then analyses, visualises and further processes this data.

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After successful piloting now the joint rollout

The partnership between ALMiG and Vodafone/grandcentrix started at a time when the Modbus Cloud Connect product was still in final development. Due to ALMiG decided to be one of the first pilot customers to test the numerous advantages of this product. The successful pilot phase was followed by the joint rollout - and thus the equipping of new devices as well as existing devices in the field with Modbus Cloud Connect. The product now enhances ALMiG's air compressors around IoT capability.

What are ALMiG and Vodafone/grandcentrix working on next?

ALMiG intends to further expand the IoT and cloud connection of its products in the future in collaboration with Vodafone and its subsidiary grandcentrix. The plan is to Establishment of an additional cloud platform for the long-term development of professional applications and opportunities for commercial use.

A large number of data points obtained from the compressors can also be used to derive new insights, which in turn enable new applications. For example, customers can be given individual usage and service instructions. The results of data analyses are also incorporated into product development.

Together with the data science experts from grandcentrix, ALMiG is taking a close look at this topic and creating the basis for new innovations.



grandcentrix offers a test package that contains all the necessary components for testing the solution in the respective product environment.

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TO THE POINT: GRANDCENTRIX

grandcentrix, a wholly owned subsidiary of Vodafone, supports companies in the successful implementation of IoT projects. This includes customised IoT solutions (Professional Services) as well as plug & play IoT products such as Modbus Cloud Connect. The focus is always on networking customer products with expertise in all IoT areas - such as embedded engineering, production/certification, cloud, app, security or data science.

INDUSTRY: IoT, Technology
 EMPLOYEES: around 200

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TO THE POINT: ALMiG

ALMiG stands for automatic air pumps - Made in Germany. The company, headquartered in Köngen, Baden-Württemberg, is one of the leading system providers in compressed air technology and has been part of the globally active Taiwanese Fusheng Group since 2012. Its customised systems for the generation and treatment of compressed air are now used in virtually all industries worldwide.

INDUSTRY: Compressed air technology
 EMPLOYEES: around 250

VODAFONE/GRANDCENTRIX SOLUTION: Modbus Cloud Connect

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