

**ROTH**KOMPLETTE  
AUTOMATISIERUNGS-  
LÖSUNGEN[www.roth-gruppe.de](http://www.roth-gruppe.de)

## Big Data and Predictive Maintenance

Predictive maintenance refers to techniques that help determine the condition of in-service equipment in order to predict and/or optimize when maintenance should be performed. Predictive maintenance is one of the most important benefits of the Industry 4.0 revolution. By consolidating the machine data from many different locations in a central place, the optimization of machines and production processes is possible. Thanks to a remote maintenance solution from the Roth Group including components from Endian and the cloud solutions from Amazon Web Services, customers in any industry can benefit today from the advantages of digitization.

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**Armin Roth**  
CEO of Roth Sondermaschinen and Roth Steuerungstechnik  
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"The solutions of Endian and Amazon Web Services helped us increase our efficiency in support as well as customer satisfaction", confirms Armin Roth, CEO of Roth Sondermaschinen and Roth Steuerungstechnik. "As a medium-sized company, we are thus successfully using the possibilities of the digital transformation to further expand our market position as a service provider."

Founded in 1984 the Roth Group develops individual automation solutions for its customers from various industries. With its companies Roth Steuerungstechnik GmbH, Roth & Schoder GmbH and Roth Sondermaschinen GmbH the corporate group covers the entire automation workflow – from software engineering (robots, SPS, NC), hardware project planning, control cabinet solutions, PC based automation to manufacturer-independent system integration for special machines. The experience is used both for new plants as well as the retrofit of existing plants across their customer projects.

The Roth Group were early adopters and a leader in the use of predictive maintenance as they recognized the advantages it could provide to their customers. By using big data, the Roth Group's service increases the availability of its customers' facilities. For the last several years, they are taking advantage of the benefits in order to reduce their response time and the customer maintenance costs.

Prior to implementing predictive maintenance, a technician had to drive to the customer for maintenance purposes or in the case of any disturbances. This was time-consuming and expensive. With the aim of further optimizing the service, the Roth Group was looking for a solution that could be used to analyze data from machines at different locations in a central database and thus enable predictive maintenance.

## Endian Connect – Flexible IoT Management

With such complex automation solutions as are created by the Roth Group, a remote maintenance solution has to meet two main requirements. First, all access to the remote maintenance system must be logged, so that every remote maintenance session is absolutely transparent to the customer. Second, it was critical to protect the machines from external attacks as well as the remote site connections.

The Roth Group therefore chose a solution from Endian, one of the leading security vendors for Industry 4.0: Endian Connect Platform provides secure and highly scalable access to a large number of endpoints with an equal number of simultaneous connections. The solution is based on a Unified Threat Management System (UTM). These devices include many network security features, such as antivirus, firewall, IPS (intrusion prevention), and many more, to effectively block complex threats. Endian stores the historical log files and provides complete monitoring of all accesses. Each connection is also secured by a SSL-based VPN tunnel which strongly encrypts all the communications.

The key element of Endian Connect Platform is the switchboard. This IoT management tool provides secure remote connectivity between people, things, processes and networks. Multi-client capability is a key feature: Individual users or user groups only have access to the applications that are relevant to them. Internal support staff at Roth only has access to the customer's approved machines and systems. If necessary, the customer himself can also get access. By this way the customer can understand who had access to which application and who will have access in the future.

## Plug & Connect: Fast implementation, easy to use, secure connection

The Industrial Gateways Endian 4i Edge 112 and 313 are used to connect the systems in the field to the central switchboard. It was the simple implementation of the gateways that convinced the Roth Group. In particular, the Plug & Connect function enables a simple and fast deployment of many remote devices to the central management tool. To do this, an administrator quickly and easily pre-configures all the gateway devices. Next, someone simply plugs

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**Raphael Vallazza**  
Endian Chief Executive Officer  
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the remote gateway device to an existing network with access to the Internet and the device will download its configuration and create a secure connection to the central management tool (switchboard). A costly deployment of IT specialists for the connection of decentralized devices is no longer necessary because even employees without special IT knowledge can easily connect machines by using this feature.

The 4i Edge Gateways provide more than simple remote access to PLC, CNC, and robotic machines and equipment. The connection works in both directions which also makes it possible to read the machine data from a central location.

## Big Data for new value creation models

Depending on the application, the Roth Group, for example, records operating hours, fault conditions, speeds, quality data and many other data from the systems they have programmed. The data obtained are used to calculate the OEE (Overall Equipment Effectiveness), provide information on user behavior and form the basis for predictive maintenance. Secure and scalable access through the Endian Switchboard allows multiple stakeholders access to the data. By using Amazon Web Services a new platform could be created that would adapt flexibly to growing use. Machine data from disparate locations are centrally consolidated through Amazon Simple Storage Service (Amazon S3) and Amazon Elastic Compute Cloud (Amazon EC2).

This ensures that data is secure and available at all times, taking data usage to a new level. The multi-site analysis and evaluation effects make it possible to predict with much greater precision the conditions under which a system runs optimally. This offers the opportunity to optimize production processes and minimize downtimes. For the future, the Roth Group plans to gain further insight by analyzing the data, which will provide the company and its customers with even greater added value.

"With Amazon Web Services, we can create a dedicated infrastructure for our customers in minutes," says Raphael Vallazza "The solution is stable, redundant, scalable and secure. The customer can decide in which country the data center must be located. In addition to IAAS services, Amazon Web Services also offers PAAS services, which can be very interesting for some projects."

"To date predictive maintenance is often only used by large and international companies," says Armin Roth "In combination with the products of Endian and Amazon Web Services our solution enables mid-sized companies to improve their service by using predictive maintenance."

## About Endian

Endian is a leading security vendor in the field of Industry 4.0. The company's declared goal is to set technological standards in the market for highly secure data communication. The company, based in Eppan, South Tyrol, was founded in 2003 by CEO Raphael Vallazza and a team of experienced network specialists and security experts. The product portfolio ranges from security solutions for SMBs to hotspot management to solutions for industrial production plants

[For more information, visit www.endian.com.](http://www.endian.com)

## Roth-Gruppe

As a supplier of complete automation solutions, the ROTH Group has been developing intelligent and flexible solutions for companies and organizations since 1984 in order to keep their machines and plants up to date. Whether software engineering (robot, PLC, NC), hardware engineering, switch cabinet construction, PC based automation or as system integrator for special purpose machines - ROTH covers the complete automation workflow.

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## Amazon Web Services

Amazon Web Services (AWS) is a secure platform for cloud services such as computing power, storage options, networking and databases, delivered as a utility: on-demand, available in seconds and with pay-as-you-go pricing. The more than 100 different services, which include classic IT applications such as storage, network or computing capacity, but also services in the areas of Internet of Things (IoT) or Artificial Intelligence (AI), can be used in a variety of ways to meet the needs of the customer. New services are quick to provision, without upfront capital expense, allowing enterprises, start-ups, SMBs and customers in the public sector to access the building blocks they need to respond quickly to changing business requirements. In total, AWS serves millions of active customers worldwide, tens of thousands of them in Germany.

[For more information, visit https://aws.amazon.com.](https://aws.amazon.com)