



Eaton supports the development of the next generation of sewer robots

IMS Robotics is constantly working to improve its product line of sewer robots and related accessories. In its drive for better performance and greater industrial applicability, the company relies on Eaton's expertise in the areas of controls, drives and circuit protection. This cooperation resulted in the optimization of Eaton's XV300 platform for a broader range of application, the customization of the Galileo visualization system, and the birth of a new generation of robots.

Standort:

Ottendorf-Okrilla, Saxony,
Germany

Challenge:

Developing mobile controls for sewer robots, supporting the development of the next generation of robots

Solution:

Further improvement of the XV300 platform, customer-specific adaptation of the Galileo visualization system, use of XV102, XP500, SmartWire-DT, RMO, DE11, PXL, MFD, CP8, P1-3, PKZ, Z-R

Results:

A new generation of robots featuring improved and automated documentation functionality. This makes it possible to be even more responsive to customer demands.

"Thanks to the new technologies and Eaton's support during the development phase, we are now able to offer our customers innovative and user-friendly rehabilitation systems that are faster and more efficient than ever before."

*Dr. Mathias Neumann,
Head of Development
at IMS Robotics GmbH*

Background

IMS Robotics GmbH (IMS Robotics), a cutting-edge provider of environmental technology, was founded in Ottendorf-Okrilla near Dresden in 1992. In particular, the Saxony-based firm specializes in sewer cleaning systems, high-pressure water technology and UV-curing equipment, as well as the development, construction and manufacturing of mobile robots for sewer refurbishment. This technology allows sewer maintenance companies and municipalities to rehabilitate sewers and build new sewage systems without the need to dig up roads. In addition to small mobile cutting robots for connecting households and sewers, the company also offers self-driving milling robots for trunk mains. Rehabilitation and UV-curing systems complete the company's portfolio. For robots in the small-pipe segment, the company is a global market leader.

Challenge

Ever since building their first robot in 1994, the company's developers have been working continuously to improve their technology. Their aim is to offer customers as much added value as possible, by enhancing the capabilities and the industrial applicability of their products, and making them more user-friendly. Core challenges include mobility, controls and visualization. Previously, IMS Robotics relied on components and software from a variety of providers. The result was a system that was relatively error-prone and complex to maintain. Matters were further complicated by the fact that many of the relevant technologies were adapted from the consumer sector, which limited their industrial applicability. Given the lack of applicable market standards in this demanding sector, the company had to come up with its own mobile solution for controls and visualization.



Powering Business Worldwide

To tackle these challenges, IMS Robotics looked for a partner that could help it further professionalize the technology and enhance its industrial applicability. The goal was to find a single-source provider for the delivery and maintenance of as many components as possible. This posed a special challenge in light of the harsh environmental conditions in sewage systems and the possibility of collapsed pipe shafts. An additional aim was to make it easier to operate the technology.

Solution

The company chose Eaton for its proven capabilities to provide the full spectrum of electrotechnical components required to control and operate sewer robots, including drives and circuit protection. "As we had already used Eaton components and modules before, we knew that they would meet our high standards. In our opinion, Eaton is a market leader in the field of panels," says Dr. Mathias Neumann, Head of Development at IMS Robotics. "In addition, the company has a wealth of expertise in industrial applications, from which we can benefit in the further development of our systems."

As soon as the cooperation got under way, the software developers from Eaton and IMS Robotics started the fine-tuning of the Galileo visualization system. In the absence of an applicable market standard for the visualization of sewers, these changes were crucial for the implementation of a meaningful visualization via the Galileo

system. Alongside CoDeSys and Galileo, IMS Robotics also received access to the first devices of the new generation of the portable XV300 platform. Thanks in part to the collaboration with IMS Robotics, Eaton was able to further improve this technology. The small size of the XV300 HMI/PLC, which also has a CAN interface, as well as the use of Eaton's space-saving SmartWire-DT technology make it ideally suitable for use in mobile robots. IMS Robotics plans to eventually incorporate these new technologies in its entire sewer rehabilitation product range. The company's systems cover the entire portfolio of sewer rehabilitation, from sewer robots for household pipes and trunk mains to high-pressure water technology and UV-curing systems. In spite of the mobility and flexibility of the systems, customers frequently request complete truck-based installations. Consequently, IMS Robotics also acts as a single-source provider for this service and equips entire trucks in line with customer specifications. These vehicles are fully equipped with a comprehensive portfolio of the company's devices, as well as the necessary accessories including condensers, compressors and generators. Additionally, these trucks also feature a control room and a kitchenette. One option for implementing the controls and visualization inside the control room is the XP500 industrial PC with 21.5 inch display, which can also store the generated data. The compressors are controlled using Eaton's multi-function display.

Since the UV-systems require a high degree of process safety, the components must meet tough reliability standards. Besides Eaton's touch panels, IMS Robotics also uses the DE11 variable-speed starter to regulate the cable reel speed. In addition, the company relies on a number of other Eaton products, such as the DILM contactors, motor-protective circuit breakers, PXL miniature circuit breakers, P1-3 rotary switches, Z-R installation relays, RMQ pilot devices, and SmartWire-DT.

Results

The collaboration between Eaton and IMS Robotics is characterized by the joint development of successful solutions, resulting in a win-win situation for both sides. The joint efforts to adapt the Galileo system to the special requirements of wastewater technology allowed IMS to improve the next generation of its robots, while Eaton was able to optimize the XV300 HMI/PLC for broader market use.

As a result, all of the company's robot systems now contain Eaton technology. While the mobile systems are primarily controlled and visualized using the XV300 platform, the control room of the truck-based solution is equipped with the XP500 industrial PC. All the generated data are recorded and are therefore available for documentation purposes or any follow-up work. This facilitates a seamless integration of the individual operations involved in sewer rehabilitation, resulting in significant time and cost savings for the client. Since many of the clients are public entities with

particular documentation needs, the possibility to document all work stages is of the utmost importance.

For IMS Robotics, the benefits of using SmartWire-DT are twofold: As the leanest system on the market, it not only saves space and installation time (by up to 90 %), but can also document each operation automatically and accurately via a time stamp.

A combination of two factors helped keep the costs in check: the use of the MFD-Titan display as an affordable solution for controlling the compressors, and Eaton's role as a single-source provider. What's more, using SmartWire-DT reduces costs by saving space, material and time, during installation and maintenance, as well as in terms of the final documentation.

"We are very happy that we have been able to further improve our systems by switching to Eaton's technology. This has also enabled us to be even more responsive to the demands of our customers," says Neumann. "Even though some of our systems are already entering the fourth generation and we have gained a lot of experience in the process, the constant improvement of our products is one of our priorities. Thanks to the new technologies and Eaton's support during the development phase, we are now able to offer our customers innovative and user-friendly rehabilitation systems that are faster and more efficient than ever before."



The development of the HMI/PLC XV300 platform and the newest generation of mobile sewer robots went hand in hand.



The green SmartWire-DT wiring in the switch cabinet not only saves space and time, but also allows for the detailed documentation of all operations.



In addition to the Galileo mobile visualization system, IMS Robotics uses the full range of Eaton's switches, pilot devices and contactors.

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Publication No. CS083131EN / CSSC-601
November 2017

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