

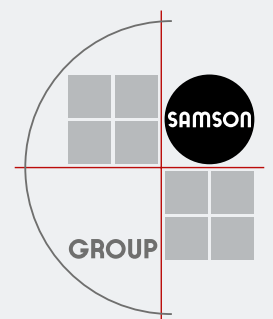


■ SPECIAL PRINT

Digitalization of Industrial Control Valves



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Digitalization of Industrial Control Valves

No development in the past decades has had such an impact on our lives as the growing opportunities of recording, saving, processing and exchanging data. We have automatically integrated new products and systems into our everyday lives, smartphones and car navigation systems being the two most prominent examples. Traffic management systems used on our roads also impact our lives. They digitally count cars and measure their speeds. These data are collected and analyzed together with weather data. Based on these data, the maximum permissible speed on a certain stretch of road is determined to increase its "availability". Simple statements, such as there being heavy traffic on a road, are things of the past. The same development from analog to digital technology can also be seen for industrial control valves. In globe valves, for example, the valve stem position can be read off the mounted travel indicator scale directly at the valve. The classic analog technology was developed in the 1960s: an analog device defined the set point and possibly also fed it back but without including a microprocessor. Today, digitalization in the form of the positioner has made the control valve transparent by continuously collecting and assessing valve data and making them available for further use. This opens up opportunities for data analysis that also allow the control valve to be assessed. Together with further information, conclusions can be drawn that go beyond mere analyses of the control valve's condition, which can ultimately be used to increase plant availability.

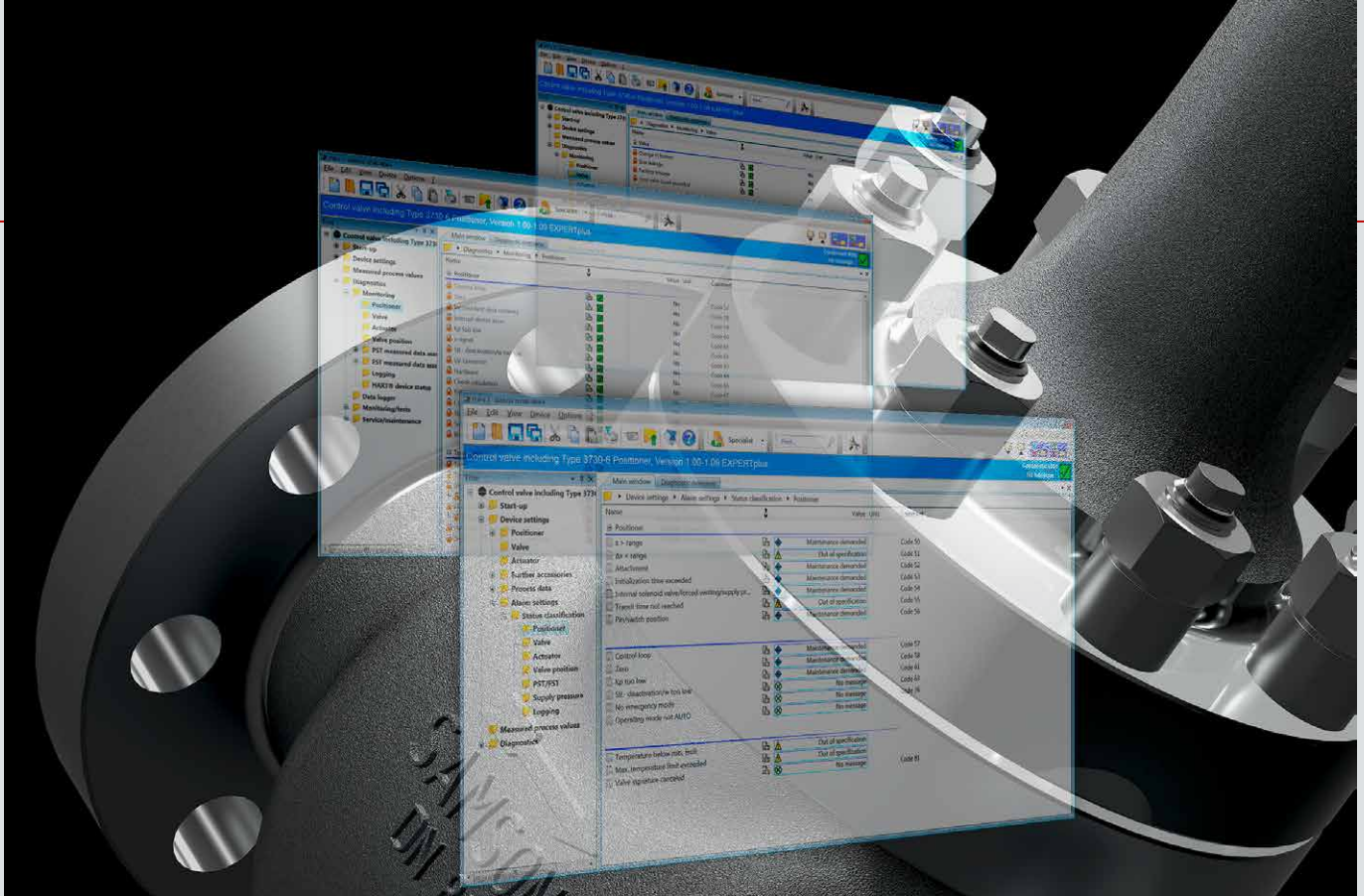
SAMSON, as a manufacturer of valves and valve accessories, recognized the benefits brought about by the digitalization of control valves at an early stage in the development. Ever since, the focus has been on this topic with SAMSON taking an active role in its implementation and further development. Back in 1986, SAMSON already participated in a joint project set up by different industrial companies to define a fieldbus for automation later to become PROFIBUS. Communication as it is offered by fieldbuses, for example, is essential to digitalization to

forward collected data and/or data analyses. Currently, control valves are digitized using valve accessories, mainly positioners. In 1995, SAMSON introduced its first digital positioner with HART® communication to the market. In 2001, the Series 3730 Positioners were added to the product range. The series comprises positioners with integrated diagnostic firmware and different communication protocols. In 2012, the 75th annual general meeting of NAMUR was held with the focus on control valve engineering. Dr. J. Kiesbauer, member of the SAMSON AG executive board for R&D, gave the keynote speech, describing the evolution from manually operated throttles to smart control valves. SAMSON made essential contributions to all stages in control valve development described in the speech.

Today, mainly control valves for challenging tasks are equipped with positioners. Simpler valves, such as on/off valves for example, continue to be fitted with solenoid valves and/or limit switches. Their digitalization has not progressed quite at the same pace, even though SAMSON also offers digital solutions for such cases, for example the digital Type 3738 Limit Switch. The task for SAMSON is not only to meet the requirements for digitally interlinking supply chains at the customers', but also to develop innovative solutions, e.g. for industry 4.0 environments. Control valves must be able to both transmit data to the entire system as well as to receive them. There is still some catching up to do in the digitalization of on/off valves to achieve the same level as for throttling valves. This is where benefits for business still need to be generated.

Digitalization allows control valves to be monitored around the clock. Variables that can directly be measured, such as the set





point, actual value, set point deviation or actuator pressure, can continuously be recorded and in the future, it will be possible to supplement them with further information. SAMSON counts on over 100 years of experience in valve engineering and has accumulated the necessary know-how to analyze the collected data and draw the right conclusions. The positioners alert operators of faults in or on the valve at an early stage. Messages indicating, for example an internal leakage or defective actuator springs, do not require the operator to further analyze the transmitted data. Together with the high-quality EXPERTplus valve diagnostics integrated into the positioner, digitalization increases plant availability as possible faults can be detected and removed at an early stage. The objective for the future is to entirely prevent faults, for example by predictively stroking the valves in the plant as well as by proactive maintenance management. This makes the associated data and analyses on the control valves in the plant indispensable and provides an essential competitive edge. At SAMSON, the influence of digitalization goes far beyond the actual products: it has effects on all areas from production to after-sales services. As an innovative company, SAMSON is at the forefront of the evolution and new development of valves and valve accessories. Modern after-sales services are based on data collected throughout the product life cycle, which allows maintenance on individual valves and entire plants to be planned and performed systematically. What happens with the collected data will be crucial for new developments in the future. Digitalization is not an end in itself; merely collecting and communicating data is not enough. Data must be made available for further use. This requires separating

important from unimportant data and analyzing the gathered data in a targeted way. To make reliable statements on the condition of a valve, data analyses must be based on sound valve knowledge. At SAMSON, the staff's know-how on valves, actuators and positioners as well as the customers' knowledge of the processes are integrated into the EXPERTplus diagnostic firmware. The undisputed benefit of such diagnostic results can be increased many times over if they are integrated into the process as well as into plant and maintenance management. On the one hand, this implies mastering the technical challenges, i.e. managing the amount of data and creating a uniform communication interface. On the other hand, companies must be prepared and willing to commit to a high degree of digitalization and define its limits. Which data do we want to be transparent? Are data sufficiently protected? How much of our corporate know-how do we want to become public knowledge? We are already familiar with such and similar questions from our private environment. SAMSON and the customers also need to find answers to them to fully exploit all opportunities presented by digitalization.

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