

TURCK editorial

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TURCK

Sensortechnik
Automatisierungstechnik

Automation right from the word go

Our A&D interview with: Frank Denk, Alfred Hack und Christian Wolf, Hans Turck GmbH & Co. KG, Mülheim a. d. Ruhr

The higher the level of automation, the more important the information transferred from the factory floor to the higher level control. The company Hans Turck GmbH, considers the sensor to be the first link in a chain, ranging from the machine through the control to the corporate planning level. The company Hans Turck GmbH & Co KG, based in Mülheim a.d. Ruhr, has engaged in great efforts to gain a position as a "full line supplier" for application engineering below the controller level. The editors of the A & D Newsletter asked the three managers in charge of fieldbus & interface technology, sensor technology and corporate marketing, Frank Denk, Alfred Hack and Christian Wolf, to assess to what extent the company has succeeded in achieving its targets.



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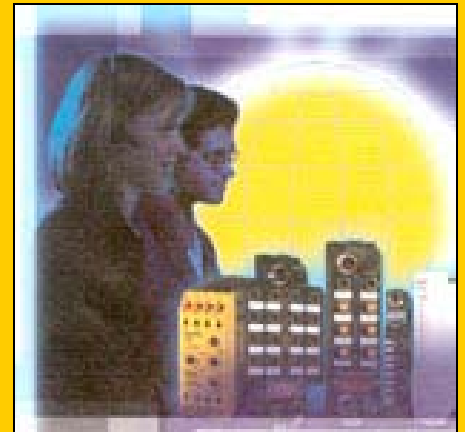
What are the business divisions that form the company?

Hack: Our traditional business is the development and production of sensor technology products. This sector can be subdivided into position and proximity switches, i.e. inductive, capacitive and magnetic-field sensors. The product spectrum is complemented by ultrasonic, photoelectric and process sensors and linear and rotary position encoders. The second division comprises interface technology products including all the classical signal processor designs, and the third division incorporates fieldbus technology products with a clear focus on factory and process automation.

Wolf: In the hierarchy of automation, the machine is the basis where signals are recorded by sensing products. Our especial competence in industrial switchgear rests on this level and ranges today from simple connection products to the remote I/O level. We are presently strengthening our position as a true full line solution supplier, offering our customers the entire scope of application engineering below the controller level.

How would you rank the three business divisions, i.e., interface, fieldbus and sensor technology?

Wolf: From a financial viewpoint, the sensor division continues to be our core business. Globally seen, this segment yields the major part of our profits. The focus is on position and proximity switches. Interface technology is another sector in which we are commercially highly successful.



We offer twenty-five years of know-how in design and production of signal processing devices for process automation. An especially promising market, to which we are strongly strategically oriented, is the fieldbus sector. At present, this sector still falls under the category of "subsidy business". Due to the high development expenses incurred by customer-specific products we are not yet in the black. However, we reckon that these high investments will amortise within the next two to three years.

Your roots are in the field of sensor technology and now you are growing into a full line supplier for the automation sector. Is this decision a concession to present trends?

Wolf: This is definitely not a question of following a trend, but of complying with market needs. Moving with the times, the challenges of automation have changed.

In view of ever more complex automation needs we cannot restrict ourselves merely to the pure sensor & actuator level. It is natural that the requirements of our customers have also changed in line with this development. Today, comprehensive customer support and counselling are decisive factors for success. Application engineering is the magic word. Our customers consider us to be their partner for their specific application solution. Living up to these expectations, we have expanded our product portfolio which is now truly that of a highly competent automation partner. Such a versatile and comprehensive product range is a convincing argument for our customers, who come from all kinds of industries: the engineering sector, the automotive industry, process automation, the food & beverage industry and packaging and handling. In order to succeed in all these markets, it is obvious that we have to offer such an extensive range of solutions.

That sounds like quite an enormous portfolio. Has TURCK developed into a supermarket for automation?

Wolf: One should be careful with the term "full line supplier". It can easily be misinterpreted in terms of an automation supermarket or one-stop-shopping. The message to our customers is not that we are capable of doing and offering absolutely everything. To our mind, a full line supplier is a customer-oriented specialist whose programme covers a well balanced product mix of considerable width. We offer comprehensive solutions for specific automation tasks, exactly tailored to customer needs. Turck will never turn into a "supermarket" – the design and manufacturing process of our products is simply too specialised, complex and sophisticated. As a solution provider it is logical that we assume full responsibility towards our customers, because, in the final analysis, the customer is the determinative factor in creating the profile of a full line supplier below the controller level. We believe that with this transformation we have paved the way to a secure future of our company.

What must a sensor manufacturer actually do to achieve such high goals?

Wolf: Initially, we develop customer specific solutions and from these we then derive and create market standards. Our uprox[®] sensor is a good example of such a progression.



Fig. 1 Expertise and many years of experience, from thick-film hybrid production through SMD assembly to bond technology, characterise the company's production know-how.

uprox[®] is a "factor 1" sensor that detects all metals at the same distance. We clearly recognised this as an essential customer requirement. An individual customer-specific solution proved to be a widely needed and accepted product for a large market. The same strategy applied to "excom[®]", a remote I/O system for explosion hazardous zone 1 environments, and to "piconet[®]", a series of small and compact fieldbus modules in IP67. These initially customer-specific solutions were so successful that they set market standards to which our competitors have to adapt today.

Does that mean that competitors are actually copying your products?

Wolf: No, that does not mean that our competitors actually place patent-infringing products on the market. The pioneering product simply makes it clear that the market is in need of such a product. A fieldbus module in IP67 for a robot work-cell at Daimler-Chrysler is a good example. Various other automotive manufacturers adopted the idea as a standard solution. Consequently our customers, as suppliers to the automotive industry, had to follow suit and offer comparable modules in response to the call for such a product.

We understand innovation leadership to be an honourable but not very profitable role as it also paves the way for others with similar products.

What are the additional benefits your customer can draw on because of your background in sensor technology?

Hack: Turck is an excellent example of extremely profitable innovation leadership. One of the additional benefits is that our sensors feature inherently industrial-standard designs. Sensors have always been in the front-line of automation, located directly on the machine, exposed to the most harsh of environments. We transfer this sensor-specific know-how to all our other components that, for example, are destined for use at the wiring and signal processing level. Robust and industry-tested designs combined with high quality standards are thus also characteristic of our remote I/O systems. Many of our competitors originate in the control technology sector with a focus on IPC, PC and PLC type systems. They find it difficult to adapt to the harsh industrial world with its highly specialised requirements, such as mechanical stability, electro-magnetic capability and temperature resistance, and thus have to undergo profound and lengthy learning processes. For us, the industrial environment has always been the central focus of our activities, so that our customers can rely on immediate support and response.



Fig. 2: uprox[®] sensors detect all metals very precisely at the same distance while offering optimum magnetic-field immunity.

In the beginning was the sensor. What is your contribution to the future of sensing technology?

Hack: The sensor has replaced the mechanical switch. Electronics are used where mechanics are subject to wear and tear. That is the classical history of the sensor. Over the years, the original sensor has adapted flexibly to its environment with a large variety of different housing styles, sizes, functions and signal types. We see three different trends clearly associated with sensor technology. Sensor miniaturisation, the call for larger switching distances and the analogue signal as the signal of choice. These trends are reflected in our three business divisions. Our traditional interface technology developed into "excom[®]", while the connection and wiring programme matured into our fieldbus technology division. In future our more complex sensor systems will feature bus-compatibility.

When will bus compatible sensors attain standard status?

Hack: As soon as there are cost-effective solutions available which are widely accepted by customers. Recent solutions, such as the uprox[®] factor 1 sensor, have shown that the customer does not adopt and accept products as a standard on account of an outstanding marketing concept. Cost advantages and efficiency are the decisive factors leading to the standardisation of an application. Companies solely promoting manufacturer-specific solutions in an attempt to distinguish themselves from their competitors, will certainly not reap success.

Wolf: Innovation that disregards commercial factors simply misses the mark. We favour developments that are initiated by the market, resulting in a product with high customer value, i.e. a product which saves installation time, reduces maintenance costs and meets especially high quality demands. Apart from fundamental research, all our development and design activities are oriented strictly towards customer needs.

How would you describe the product utility that finally caused you to go into fieldbus technology?

Denk: 16 years ago we developed the proprietary fieldbus system "sensoplex[®]". A renowned automobile manufacturer and a key customer of Turck's sensor and connection products, contacted us with the idea of transforming a passive junction into an intelligent station. That was the moment that gave birth to sensoplex[®]. Today, we offer products for open bus systems such as Profibus, DeviceNet, Interbus and other future bus systems such as Ethernet. Our strategy is not only to offer the individual I/O station but also the entire periphery, comprising standardised connection products for the bus, the power supply, repeater and spanner modules; in other words, an entirely automated I/O level right up to the connection of the controller.

Where do you see the starting point for your automation strategy?

Denk: We consider the starting point for automation to be directly in and on the machine. We have excellent knowledge of attaining high degrees of protection; for example, all of our field sensors are completely encapsulated. Turck I/O stations also comply with IP67 ratings. The customer is thus able to implement his automation concept directly at the lowest level of automation, i.e. on the machine, just where the signals are generated. Another advantage is that our products for the different fieldbus types feature identically sized housings and electromechanical designs. The customer will recognise the same mechanical construction, the same connection technology and the same front-end. With a range of such a scope at hand, he can respond flexibly to the needs of the end-user. A system engineer planning an installation for an American automobile manufacturer will probably opt for DeviceNet as the preferred bus system. Sometime later he will construct a similar plant for the European market, based on Profibus as the most frequently used bus system in Europe. He can work with a one-to-one copy of his installation scheme for our components, the only differences he has to consider are the customer's specification of bus and controller type.

Can you give an example of that?

Denk: A robot application at DaimlerChrysler requires the fieldbus station to be connected on top of the robot head. The customer's bus of choice is Profibus. Today, we offer the same station for other customers using DeviceNet and Interbus specific equipment. We respond to an application inquiry from a customer by providing a specific solution. Then we try to use this solution also in other applications and so establish a standard for this particular sector. In short: we optimally recycle once attained knowledge for the benefit of our customers.



What is TURCK'S role in the Ethernet league?

Denk: We try to define and position open standards. The attempt of using a multivendor system often fails because of the different connection technologies involved. Since the components cannot be interconnected, everything has to be obtained from a single source, thus causing an undesirable dependency on a single supplier. In order to standardise Ethernet connection technology, we participate in the IAONA work group. Our present product spectrum for Ethernet features standardised and proven M12 connection technology. DeviceNet and Profibus networks are based on M12 bus and sensor connection technology that is now also available for Ethernet. Components and switches with high protection ratings supplement the Ethernet network. To date, we are the first to offer I/O stations with identical front-end circuitry for Ethernet. Turck, however, as a medium-sized company, simply has to wait and see which bus protocol will succeed. We trust in the market to establish a standard and until then simply continue to support the defined bus systems. Our first test installation, based on Ethernet in combination with a TCP/IP Modbus, will be presented in cooperation with a large system engineering company in the second quarter of 2003.

Is it true that this strategy can only prosper if you co-operate with market leaders in this sector?

Wolf: Absolutely. The closeness between customer and market leader is decisive. Of course, it could be interesting to develop technological solutions in co-operation with smaller companies. In this case, however, the standard setting strategy can hardly catch on. It pays off to co-operate with those at the top of the ladder for strategic reasons. A company with more than 1600 employees worldwide cannot survive on customer specific solutions of limited scope.

A company assisting others in automating their production, surely faces high expectations regarding quality assurance. How is your production organised in terms of quality assurance?

Hack: All our production sites and all our distributors are certified to ISO 9000. An important characteristic of our production system is that we not only test every individual product for its quality but that we also optimise every single process in advance. The next step will only be performed if the preceding process is stable. This principle guides us right from the start. A product can only be manufactured if product design and production interact smoothly. Therefore our research and design department, that is responsible for the product, co-operates closely with the quality management department and the test lab. Once we start manufacturing the initial product series, you can be quite sure that not only the development and the approval stage have been completed with positive results. The entire test and manufacturing equipment is ready to be put into use. In line with this scheme we optimise every single stage of the production process.

You just described the conditions under which you manufacture. Are there any technologies that have to be outsourced?

Hack: Printed board assembly, component mounting and packaging of integrated circuits belong to the core competencies of our company. To maintain this competitive edge, we attach great importance to keeping pace with state-of-the-art technologies in this field. Just think of chip-on-board and hybrid technology that pose a constant challenge, particularly in view of the customers' call for ever smaller components and higher precision. Of course, all this entails high investments. Shortly we will have three sites for the production electronic components. At present our production is located in Halver in the "Sauerland" and in Beierfeld in Saxony. A third production facility for PCB assembly is presently being built in Switzerland. The synergies evolving from the close co-operation with our daughter company, TURCK Duotec GmbH, a system and service supplier of hybrid circuitry and SMD technology, assist us in providing solutions readily tailored to individual customer requirements. By teaming up with Duotec we are able to offer our customers application-specific electronics.

Crisis or not, business strategies always have to stand the test of time. How does Turck survive in today's harsh economic environment?

Hack: The strategy of innovation as a helpful resource in bad times seems to work successfully, provided that such innovation really enhances the customer's productivity through process optimisation. The present situation seems to be a repetition of the crises experienced ten years ago. As in 1992, Turck will not have to cutback on staff or suffer grave financial losses thanks to its well-balanced and customer-oriented portfolio. In this phase, when everybody seems anxious to excel in making gloomy predictions, we have introduced completely new product lines and innovative solutions for increasingly better and more efficient automation concepts.

Wolf: In Germany we have not yet reached our financial targets, but even so we exceed last year's results. Internationally, we have managed to achieve a plus of 8 percent. Strategically we concentrated on three key markets: primarily Germany and Europe, and secondly the North American Market, where we lead the market in sensor technology. In Asia, our third key market, we can register an increase in turnover of more than 30%. Yet also in the United States we are clearly in the black and have excellent prospects of improving our standing.

What does a growth rate of 30 percent actually mean in numbers?

Hack: In China alone, we have achieved a turnover of 20 million euro. China is an especially interesting market for us, because Turck is one of the few companies who have managed to establish a fully-owned daughter company, with more than 200 employees, based in Tianjin, near Peking. Many other companies have had to settle for a joint venture with the Chinese government. In the middle of this year, we will be starting operations in a new manufacturing site in China. Our global success definitely contributes to our above-average growth in our sector and to our prospects of winning substantial market shares in the long run.