

Field specialist goes RFID

Over its forty year history, TURCK has continuously expanded its product portfolio and is now a complete supplier for the field level. However, even the range of a complete supplier can still be expanded further. This is what the company has recently demonstrated with its new RFID system.



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According to a study from the market research institute Gartner, worldwide investment in RFID technology will exceed 3 billion US dollars by 2010. This is six times the value invested in 2005 (504 million US \$). The range of applications possible with this booming technology is also enormous. This covers, for example, the pharmaceutical and health industry, the wholesale and retail sectors, traffic monitoring, transport & logistics applications right up to industrial automation. "Studies estimate the share of industrial applications at 10 % to 30%," said Ulrich Turck, Managing Director of Hans Turck GmbH & Co. KG in Mülheim. He continues: "An annual growth of up to 30 % is forecast in this sector alone."

Developing innovations at the customer

At the Hanover Fair, TURCK presented a new RFID system offering some additional features that stand out from those previously offered on the market. "We didn't want to join this fast moving growth sector by simply launching yet another RFID system on the market," explained Christian Wolf, corporate marketing manager at Hans Turck GmbH & Co. KG. "Our company philosophy is 'growth through innovation'. However, this is only possible if the customer appreciates the additional value of the product and is therefore keen to use it. And this way of thinking can only be achieved if we include the customer in the development of the innovation right from the start and implement their requirements as much as possible," C. Wolf said of the development strategy.

With its new RFID system, BLident, TURCK is concentrating first of all on factory automation which includes the automotive manufacturing sector, transport & handling and machine building, as well as the food and drink industry. This last sector, as well as the process industry with the pharmaceutical, chemical and petrochemical industry will be approached by the TURCK field specialists at a later time, "when we have in our possession the certificates for the required approvals," C. Wolf explained.

For the Mülheim-based company, automotive manufacturing is a top priority in the field of factory automation. "The demand for custom cars is growing continuously.

The identification of the individual vehicles from the start of production is therefore very important," Wolf added. "However, a comprehensive identification system for the entire production process is currently not available," added Alfred Hack, director of the sensor technology division and co-developer of BLident. "This is due to the high costs involved on the one hand, and the different requirements of individual manufacturing steps on the other." From the customer's point of view, speed and security as well as noise immunity and temperature resistance are the most important features that an RFID system must provide in an industrial production environment.

The special features ...

"With this and other statements from our customers, we set to work at the end of 2004 and are now presenting a system that meets their requirements," said A. Hack. For a general understanding Hack first explained: "Each RFID system consists of data carriers (tags), write-read heads (transceivers), interface modules for the higher control level and, if necessary, the process control level (merchandise management system) as well as the necessary software implementation."

The experts at TURCK worked out requirements profiles jointly with their customers for all relevant components such as the tags, the write-read heads and the interface modules. "Speed plays a decisive role in every production process," explained the divisional manager. For example, in automotive manufacturing, transport systems are run at the fastest speed possible. "Automotive manufacturers criticised conventional RFID systems because they only allow static write and read operations.

This means that the data carrier has to be positioned in front of the write-read head," A. Hack explained. "Our system enables read and write operations 'on the fly', i.e. when the tag moves past. The data can be exchanged in motion, thus considerably reducing the software and hardware requirement," the expert summed up. "BLident is one of the fastest systems on the market. With data carriers without an offset and transfer speeds of 0.5 ms/Byte even transport speeds of 10 m/s can be handled without any problem."

... of the tags ...

TURCK is setting new standards, particularly with the data carriers. "EEPROM is the standard memory used with the data carriers, and these allow up to 5×10^5 write operations. We are also offering the new FRAM memory technology. These data carriers can be written up to 1010 times," A. Hack pointed out. He added the following explanation: "If, for example, data is written every second, EEPROM memory Previously, the use of data carriers in a paint line was only possible at considerable expense since they can normally only withstand temperatures up to approx. 80 °C. In paint lines, the temperature may be as high as over 200 °C.

Even read operations directly after the paint process were impossible since a cooling time was required," said Hack of the previous difficulties. This problem has been solved by the TURCK specialists with their high temperature data carriers which can be used in temperatures from -40 °C to 210 °C, thanks to the special coating. The systems also have an outstandingly compact design.

Even the transfer frequency was specially designed to meet current market requirements. "Three frequencies have become popular worldwide over the course of time: 125 kHz, 13.56 MHz and 2.45 GHz. In industrial plant engineering, the 13.56 MHz frequency is primarily used as defined in ISO 15693. That's why we chose this one," explains the expert. The benefit: It enables the data carriers to be supplied directly via the RF field, a considerably faster data transfer compared to the 125 kHz technology, which is also outside of the industrial interference fields.

... of the write-read heads

As far as the design of the write-read heads is concerned, the experts tend towards those established designs used in sensor technology. "After all, installation involves similar restrictions to those of inductive sensors," A. Hack explains. The development also ensured that the design prevented any undesired interference between two write-read heads positioned close to each other. "The channels can be switched to multiplex operation so that only the channel with a tag in its transfer window is active," Hack adds.

... the interface modules ...

This procedure is possible due to the asynchronous processing of the individual commands. This allows read and write commands to be stored in the interface modules irrespective of whether the write-read heads have a data carrier in their transfer window, the so-called "air interface". "When a data carrier enters the air interface, the data is immediately processed, enabling theoretical application speeds of up to 30 m/s to be achieved," A. Hack states.

The read data is stored in the interface modules and can be requested successively by the higher control level above it. "We offer standard worldwide bus systems such as Profibus, DeviceNet and Ethernet for connection to the higher control level," A. Hack added. He also explains: "With standard function modules we are able to simplify integration into the well-established controller world. The system also offers a simple solution for expansions. The capacity of a fieldbus node can be expanded to up to eight write-read heads by adding interface modules. These potential reserves increase planning security. All write-read heads connected in this way are processed simultaneously."

... and the Configurator

As far as practical application is concerned, customers always appreciate the same things: the distance of the tags from the write-reads head, the speed at which the object can move past them, as well as the data transfer rate. "For this, other manufacturers refer to a number of formulae by which the required parameters can be determined. Our home page at www.turck.com provides the Online Configurator with which the application concerned can be simulated and the right selections carried out. The link to our product database enables customers to try out the different options," A. Hack says of another special feature.

The success concept

Pilot customers of the BLident system include Ford and Volkswagen. "At Ford, around 4000 of our data carriers are in operation. Our high temperature data carriers are used at Volkswagen Sachsen GmbH," A. Hack reports. "Both customers have confirmed to us independently of each other that BLident is a solution that meets the requirements of state-of-the-art production for greater functionality and flexibility, as well as meeting the need for cost optimisation," explains C. Wolf and sums up: "This confirms our claim to having an innovative solution. The enthusiastic acceptance of our innovation by the customer is our top priority. For this, it is not absolutely necessary to totally reinvent the technology. As the example of BLident shows, improving existing technologies is often enough to create value addition for the customer."

This, the executive vice-president explains, is also the reason for the company's success. "For us, marketable innovations are also saleable innovations. This type of development is after all the reason for our two-digit annual growth," C. Wolf asserts. The success of the Mülheim-based company is also based on three other pillars. "Our corporate branding is naturally very closely linked to our innovation strategy. And so one of the most essential elements here is for the sales force to understand the products and to be able to sell them. This also demonstrates the fact that high-tech innovations can only be sold if they are realistic in practical terms," explained the marketing expert. Wolf describes the emerging markets as another supporting factor. "Generating a permanent two-digit growth rate in Germany is virtually impossible," the sector expert explains. However, he emphasises: "As a technology-driven company we feel very much bound to Germany as a base.

All core electronics are produced today in this country and will be in the future." However, for TURCK it is important to establish a presence in China, Russia, Eastern Europe, the Middle East, India and the USA. "In China alone we generate approximately 30 million euros yearly with around 400 employees, and turnover is increasing. We have been represented there since 1994 with a 100 percent subsidiary", C. Wolf says. He also asserts that European and American technologies are combining on the subcontinent. "Russia and Eastern Europe are important countries in the automotive sector. India is a growth market with tremendous opportunities. This year, we also established our own subsidiary there," he further explains.

However, C. Wolf regards the USA as the largest growth market for TURCK: "Our current turnover in the USA is 140 million US dollars per year with a two-digit growth rate." He also highlights the motivated employees as the most important company asset. "They are the most essential success factor. Our company has a decentralised structure," the executive vice-president states.

Outlook

The TURCK concept, with its four pillars of success, seems to be flourishing. Sales in recent years have thus enjoyed continued two-digit growth, apart from 2001 and 2002. In these two years, we didn't meet our expectations," Ulrich Turck admits. In the past financial year for 2005, the workforce of around 2400 employees worldwide generated 260 million euros.

Future objectives are also clearly defined: "We intend to continue our sales growth at between 10 % to 15 % annually", states the managing director. "We also intend to achieve market leadership in the IP67 field level, i.e. below the control level, which is not our area of expertise and which will also not expand. Furthermore, we intend to be number 1 or at least number 2 in all of our business fields. Last but not least, we also intend to achieve innovation leadership by means of market-oriented developments," Ulrich Turck says, facing a certainly interesting future.

Inge Hübner