

Technical paper

Technology trends in identification technology

The opening of markets and countries with high industrial potential makes it necessary to produce and deliver an increasing number of product variants in smaller quantities and in shorter times. Because this trend is observed in all industries and sectors, the structure and organization of logistics is important, both within a company (intralogistics) as well as the distribution logistics to distribution centers, wholesalers and retailers, all the way to the end customer. In order to produce and pick more flexibly and with greater customer orientation, the requirements placed on the logistic systems continue to increase.

It is necessary to pursue a number of objectives in order to work with greater flexibility, adaptability and efficiency:

- Reduce delivery times with suppliers
- Reduce inventory levels of finished and semi-finished products
- High flexibility of process steps
- Simple and cost-effective customization options
- High system availability
- Higher energy efficiency
- High transparency and traceability

Because in extensive and, thus, complex systems very many components must be matched to one another, these objectives continue to pose new challenges for the manufacturers and providers of such systems and components. To achieve an optimum solution, everything must be just right: the hardware chosen for controller, conveyor elements, drive and lifting units, sensors and identification devices and the customized software that records, sorts and processes all of the data.

For the individual industries, the application itself defines key parameters: size, weight, and variants of the material to be conveyed, required system throughput, number of possible targets / participants in the process, number of parallel subprocesses, etc. According to these parameters, infrastructure, networking and conveyors are planned by the manufacturer of the system.

The identification technology that is used and the choice of devices play a role here that is not to be underestimated. For each application, there are decisive requirements that can, as a rule, be satisfied by various identification technologies. The susceptibility of the respective technology to external influences, as well as the performance reserve of the devices, become important parameters. The requirements in these largely automated processes are disproportionately higher

than e.g. at supermarket checkouts and are, thus, not comparable. Among experts, the situation is described as follows: "When detecting the load carriers, we have exactly one 'shot', and that must be spot-on." A non-reading results in significant delays and multiple passages and should, therefore, be reduced to a minimum. For this reason, it is necessary to use high-quality and powerful devices that have the necessary capability and adaptability. And these are not always the most economical and the most energy efficient. The device choice can only be a good compromise.

To save the customer the need to know the various identification technologies and devices in detail, the manufacturers of logistics systems are committed to working together with experienced sensor and component providers. The technologies that are used continue to be developed and will result in new, additional possibilities. Providers who offer a broad range of products and—ideally—a high level of competence in all relevant technologies will become particularly attractive. There is yet another aspect: in addition to the support in planning and implementation, with the increasing globalization of the markets and projects, the presence of the partners in the target markets during warranty and service periods plays an important role.

As soon as the process is employed across corporate borders to also take into account distribution, the number of transfer points in various (software) systems and structures becomes considerably higher. National and regional circumstances must also be given consideration, particularly in the delivery chain. The definition and coordination of data transfer thereby become even more important in order to ensure consistent use of an applied or affixed label. In some cases, the optimum solution will be a combination of several identification technologies, again bringing the competence of the component partner into play.

Barcode technology has been field tested in practical applications for many years and is used in numerous industries across corporate boundaries. Reliable detection along the supply chain is nothing unusual, but can only be achieved with appropriate requirements on the label design, code (print) quality and label application. Due to the very high read speeds and depth of field, laser devices are often used. When changing the code type or when qualifying new suppliers, all participants can contribute to discussions and the resolution of problems until everything again runs trouble-free.

Another optical technology with high data density is the 2D code or Data Matrix code. The structure of the code provides additional security, but also requires a different reader technology. Instead of a laser, a camera chip is used that offers higher resolution but smaller measurement ranges. This identification technology also relies on the contrast of the code and requires an unobstructed line of sight and undamaged code elements. Such code labels can be produced simply and economically

using typical modern printers. And this is precisely where the difference to the less-sensitive and non-optical RFID technology lies. Unlike the optical technologies, visibility and environment play a subordinate role with this technology. Detection and data transmission occur electromagnetically and are, thus, not dependent on contrast and line-of-sight. The counterpart to the device, the code carrier—also referred to as a transponder—is more intelligent due to the integrated electronics and carries a higher price. The additional possibility of changing data during a process represents an absolute unique selling point of this technology. But, considering the fact that, after many years of barcode use, all systems, software and program modules are optimized for barcode technology, it is somewhat difficult to open and use the data-update function, since a change in structure is necessary.

Each technology has its place and its advantages. In the future, there will, therefore, continue to be more than just one technology—the application defines the requirements for the identification technology. Contrast and a free line of sight are not possible in all areas of application but, at the same time, do not pose a general problem. It will, therefore, become more important to consider the requirements and to have knowledge of the technical possibilities as well as the associated advantages and disadvantages of the available identification technologies. All devices of the various technologies can be adapted to the application at any time by means of appropriate parameters and are, thus, highly flexible—each within its respective technical specifications.

The many years of experience in the area of intralogistics and the special focus on long-term performance and adaptability of the devices make Leuze electronic a strong partner for optical sensor systems and identification. Active for more than 20 years in many areas of automatic object identification, Leuze has the entire spectrum and know-how of the relevant technologies in house: from the Reflection Light Beam Device to the area scanner, from the single-line barcode scanner to the raster scanner and omni-systems, from the 2D and smart sensors to camera solutions to RFID technology in conveyor systems or potentially explosive areas in production facilities.

This broad range of products and possible applications is made possible by a consistently high level and structure of know-how and a high function range of the devices, by the simple adaptability by means of a separate service interface, by a large performance reserve and by an integrated, modular connection concept for coupling to various networks and fieldbuses.

Press inquiries

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