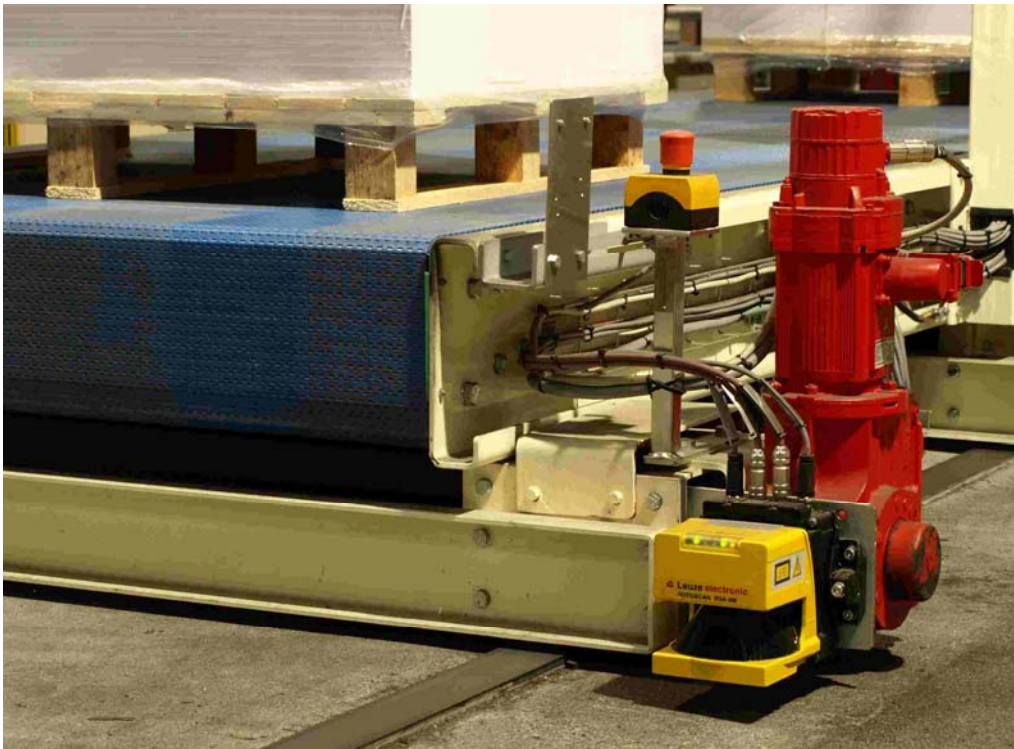


## Application Report

### Intelligent laser scanners

#### *Protecting and positioning in one device*



In-plant logistics solutions increasingly use self-driving shuttle systems, known as side-tracking skates, between the conveyors. They permit goods being conveyed to be shifted perpendicular to the direction of transport, in an automated fashion. Safety Laser Scanners on such vehicles ensure the protection of persons working in this area. The automation experts at Bertram Elektrotechnik use Leuze electronic's ROTOSCAN RS4-4M Safety Laser Scanners with the function package "MotionMonitoring" for this purpose. The robust distance measurement of this function package lets them take care of determining the vehicle's position at the same time.

Intralogsitics moves products in the in-plant material flow. *"The connection of machines or plants, especially the automated dispatch of products, harbors significant potential for savings and rationalization"* according to Dipl.-Ing. Ulf Schütze of Bertram Elektrotechnik GmbH's technical management.

The Beveran-based company has been solving automation tasks in manufacturing, materials and environmental industries for the last 50 years. *"It's becoming increasingly common to automate areas in which products have conventionally been moved by hand or forklift to intermediate buffers or packing stations,"* Ulf Schütze explains.

Shuttle systems, also commonly known as *side-tracking skates* or *distributor vehicles* offer interesting solutions for this. They are generally rail-guided and are individually adapted to the products to be moved and to the respective conveyor systems. Compared to rigid connections of conveyor lines with branches, tilting units and the like, such vehicles offer more flexibility and the advantage of leaving these areas more or less open for unhindered traffic flow of people and freely moving corridor supply vehicles.

As an example, Ulf Schütze describes a solution implemented in the paper-processing industry, where the guillotined paper is placed onto pallets and then shrink-wrapped for protection. The pallets are transported via roller and belt conveyors. The sideways distribution of the pallets to the various plant areas is implemented via side-tracking skates. *"Basically, such solutions have two requirements"* explains Ulf Schütze: *"Firstly, personnel protection in the areas where the side-tracking skates pass, and secondly the exact positioning of the side-tracking skates"*. The ROTOSCAN RS4-4M Safety Laser Scanners by Leuze electronic fulfill both requirements in one device (Figure 1).

### **Flexible safety at work**

In their basic functions the Safety Laser Scanners offer extremely flexible and universal safety at work, which can be individually adjusted to any requirement and can be very easily integrated into every production process. Similar to a radar, they constantly scan the complete working area two-dimensionally in an angle range of 190° and a radius of several meters.

The ROTOSCAN device family from Leuze electronic is characterized by its compact construction and its integrated interfaces for the AS-i Safety and Profisafe safety bus systems (Figure 2). Their immense flexibility is a result of the independent protective/warning field pairs, which can assume any field contours as well as the ability to change over between these pairs.

A range of function packages provide the user with options for deploying a tailored laser scanner for the respective requirement. In the combination with the possible protective field ranges from 2.15 to 4.00 to up to 6.25 meters and the various switching outputs, a total of nearly 20 different device models are available. Individual configurations with regard to field combination and resolution extend these options. As a result, the

ROTOSCAN RS4 Safety Laser Scanner - certified in accordance with IEC EN 61496 (type 3), IEC 61508 (SIL 2) and EN ISO 13849-1 (PL d) - flexibly satisfies the protective function in every situation: personnel protection at mobile and versatile stationary machinery.

### **Measuring system**

*"The special feature of the ROTOSCAN RS4-4M is the intelligent MotionMonitoring"* confirms Ulf Schütze. With this function, the devices are predestined for use in mobile applications such as side-tracking skates. Apart from reliable protection for the transportation path, this function permits robust measurements of speeds and distances.

The MotionMonitoring function monitors up to six speed values. If necessary, protective field adjustments are applied in the form of extended protective fields at higher speeds. Moving personnel does not interfere with the robust distance measurement in this case. The current measurement values are given a 'quality' rating. The respective rating or measurement quality of the data determines the subsequent behavior of the Safety Laser Scanner. In practice this lets people move through the sensor's measuring field without triggering a stop signal, depending on the distance and speed of a side-tracking skate. In-plant movements on the transportation path thus do not interfere with the operation of the shuttle – without restricting the safety of persons in the path.

### **Transfer positions with millimeter precision**

The robust distance measurement can also be used to position the vehicles. The new measuring procedure of the ROTOSCAN RS4-4M permits measurements of the distance to defined reference planes. This can be used to determine positions precisely. Just as for the side-tracking skates on which pallets with paper stacks are transported to the packaging machines: the conveyor segments of the vehicles can stop at the loading and discharge stations with millimeter precision to transfer the pallets. *"Compared to conventional solutions, no further measures are required for position determination, such as the installation of incremental transmitters, for example,"* says Ulf Schütze, describing the benefits.

### **Supplementary safety**

An important requirement of such 'open' conveyor paths is the safety of personnel in the transfer areas between transportation path and production or storage area. These areas are easily accessible and must be protected. For this purpose, Bertram Elektrotechnik uses Multiple Light Beam Safety Devices of the COMPACT*plus* series by Leuze

electronic (Figure 3). The decisive feature of the active optoelectronic protective device is its intelligent muting function. It ensures permanent personnel protection while leaving the material flow unobstructed. When a paper pallet passes through the Light Beam Device, the safety function is bypassed for a limited time. If, however, a person attempts to enter the safety area, the Light Beam Device shuts down the production or path section. All sensors, control and display elements required for differentiating between people and materials can be connected directly onsite on the Light Beam Safety Device.

### **Summary**

The MotionMonitoring based on the robust distance measurement allows protective fields to be adapted depending on the situation and speed. It also permits the precise positioning of shuttle systems that are equipped accordingly. Protective fields that are adapted to the movement profile increase both their availability and the safety. The operation is always immaculate under safety aspects and can be run at optimal speed. The MotionMonitoring function package also takes care of the position determination. The braking, stopping, and loading at the roller conveyors is of course also always monitored. When using Multiple Light Beam Safety Devices and their integrated muting functions, such plants meet their safety requirements in their entirety, even at the transfer points.

**A video at [www.leuze.com/rs4m](http://www.leuze.com/rs4m) shows how ROTOSCAN RS4-4M Safety Laser Scanner can be used with numerous advantages.**

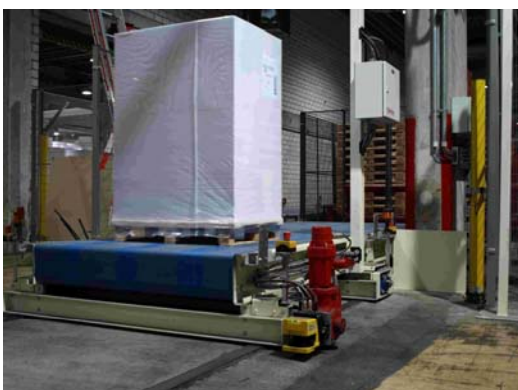
## Figures and captions



**Figure 1.** Side-tracking skates are equipped with a Safety Laser Scanner in both directions.



**Figure 2.** With the help of the PROFIBUS interface, the ROTOSCAN RS4-4M Safety Laser Scanners can quickly be integrated into the safety network.



**Figure 3.** In addition to Safety Laser Scanners, Multiple Light Beam Safety Devices by Leuze electronic take care of permanent personnel protection with their intelligent muting function, which leaves material flow unobstructed.

### **Press inquiries**

Leuze electronic GmbH + Co. KG  
Matthias May, Tel. +49 8141 5350-123  
matthias.may@leuze.de, www.leuze.com