Technical report

Really powerful!

With optical sensors, sometimes the pure performance matters most of all

The AC/DC SR 49C all-voltage sensors, with relay and MOSFET outputs for high switching power, have been completely optimized for flexible usage. They are suitable for outdoor deployment and, thanks to their high function reserves, for operating ranges up to 120 m without any operational safety limitations. Thus, to put it succinctly, you could say about these tough sensors: reliability is the prime derivation of high performance.

Inside of automated systems, a voltage supply of 24 V DC has become extremely common due to the high degree of integration of control technology, whereby regional differences with regard to the interfaces and switching outputs are typical. What's more, optical sensors must ensure reliable signal transmission and exhibit great insensitivity to fluctuations of the supply voltage – even with long cable lengths.

These two aspects become particularly important when in extensive systems, i.e. with long cable lengths, the signaling can only be assured with a single switching contact. This occurs frequently on the periphery of systems, e.g. at the end of a highly-automated high-bay warehouse and picking systems, and in distribution and truck loading areas. At the ends of such lines the supplied voltages are generally low.

Another interesting example of the typical demands of certain sectors – in this case with low control density – are the packaging systems and wood working industries (figure 1). Here too, the existing cable lengths are a prevailing issue, but simple switching signals are much more common – usually with AC voltage because of the large drives. Accordingly, sensors with relay switching outputs and which cover the widest possible voltage range are required. These are referred to as UC (Universal Current) or AC/DC sensors.

The stated conditions place demands on the sensor technology which are not to be taken lightly: on the one hand, an evident tolerance for fluctuations in the supply voltage, on the other hand an uncomplicated connection technology and interference rejection because of the frequently harsh environmental conditions.

Drawing on their many years of industrial experience and vast application know-how, Leuze electronic developed an apt solution to meet these demands. The especially rugged SR 49C AC/DC series proves itself convincingly over extremely long operating ranges (operating range limit up to 150 m, effective operating range up to 120 m) and features that make deployment both exceptionally reliable and at the same time exceedingly simple. The series consists of throughbeam and retro-reflective photoelectric sensors, as well as light scanners; there are both red light and infrared models. All of the sensors are mounting compatible with many other market-standard sensors and with the 96 and 46B series. Alignment is a quick and simple matter, thanks to the very bright light spot of the red light version and an alignment aid for the infrared devices.

"We use SR49C sensors for elevation monitoring. It didn't even take 5 minutes to connect them." Stefan Eser, KLAUS Multiparking GmbH, Aitrach, Germany

What is immediately noticeable on the sensors is the easily accessible terminal compartment on the front. It simplifies mounting and expands the deployment possibilities, as it allows the installation in very confined installation spaces or in corners. Connecting the devices is quite easy: open the housing cover, push in the wires – that's it (figure 2). Hooking up wires couldn't be easier. The cable itself is fed into the sensor from below or the rear at a 45 degree angle. And that, thanks to the spring terminals, is exactly what saves a lot of space and spares the electrician straining and annoying fiddling around with screws when mounting and dismounting units. Status LEDs which are highly visible from all directions facilitate the alignment and diagnostics.

The SR 49C is characterized by state-of-the art sensor functionality, for instance the adjustable (by teaching) light/dark switching and the adjustable switching delay for the switching behavior of the outputs (0.5 s). The sensitivity of the sensor adapts to the respective application by means of a potentiometer. What is remarkable here is the ALC automatic sensitivity readjustment. To the greatest extent possible, it prevents the total reflection at close distances to the reflector. If contamination build-up begins, the optics still consistently maintain their sensitivity, switching point and function reserve.

Optional integrated optics heating ensures the reliable detection of objects – particularly in material flows, in transitional areas between inside and outside, or in varying temperature zones – where fogging or condensation can occur (figure 3). High degrees of protection of up to IP 69K, made possible by the new housing design, are especially valuable in such applications. The firmly cast-in sensor circuit board withstands perceptible vibrations. The SR 49C scores high with longevity in outdoor use and deployment in environments with slight soiling. Consequently, the series is exceptionally suitable for systems in the wood-working industry, car parking systems, packaging plants and applications in material flows, e.g. in crane systems (figures 4 and 5).

Photos and captions

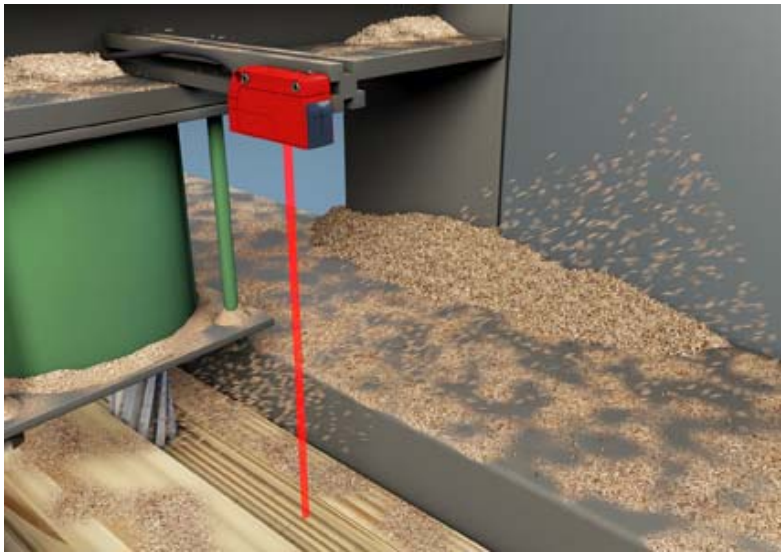

Figure 1. Things are pretty harsh here: the wood products industry places its own unique demands on sensor systems.

Figure 2. SR 49C is a sensor series that can please everyone.

Figure 3. The entryway, as an interface between indoors and outdoors, is a very particular area of application.

Figure 4. In automatic parking systems, cars cannot find a parking space without sensor systems.

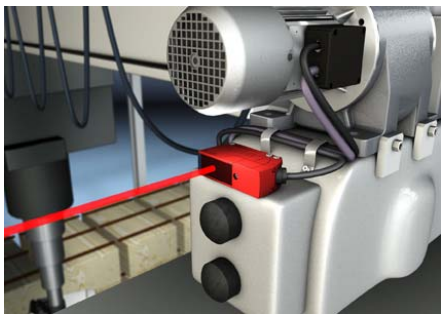

Figure 5. In crane systems, constant function reserves throughout large operating ranges are decisive.

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