

## Press Release

### 3D sensor systems – Luxury or necessity?

***Advances in light-section sensors enliven the 3D discussion.  
A commentary by Ulrich Balbach.***

3D sensor systems are rapidly gaining importance in automation technology. Increasingly, they are moving from the high-price sector into the range where they are suitable for practical use.

For optical sensors, we have so far talked about measuring or switching systems that determine the distance or the presence of an object by emitting a light beam. These so-called one-beam systems usually contain all distance information that is energetically or geometrically usable.

In addition, there are and have been surface-illuminated camera-based systems that evaluate surface elements (called pixels) two-dimensionally in the plane with regard to their light/dark distribution, usually at a higher resolution. If one combines the distance information of the one-beam systems and the high energy deposit of their illumination with the surface evaluation of a camera chip, one can obtain additional depth information – known as the third dimension. Along a laser line, one obtains not only the location of each pixel in an x/y-coordinate system and its brightness value, but also the distance via the z-coordinate.

The advantages of this technology over other, conventional systems used up to now are obvious: the additional distance information makes the user much less dependent on differences in brightness or color on an object. A body's edge, for example, can safely be distinguished from a light/dark transition in the scene in this way. This provides detection reliability. In addition, the energy deposit is higher by a factor of 1,000 for the applied, structured illumination when eye safety is taken into account.

In the past, the high price of 3D sensors and the extremely complex further processing of the 3D "point clouds" have hampered their widespread acceptance. Furthermore, the 3D sensors available to date were difficult to integrate on account of their size and the fact that their permanent availability could not be ensured.

In the meanwhile, however, extremely compact sensors, with integrated data preprocessing, have become available. The price-performance ratio has



reached a level that makes the process feasible in production-machine business. These facts are helping to advance the 3D sensor systems.

For many applications, simple point-shaped information is more than insufficient nowadays. For example, determining a pick position for the robot's grabber requires a 3D coordinate in space. Or, if one wants to determine the volume of an object, this does of course require the height in addition to the length and width. 3D sensor systems are opening new application fields within automation technology. Anywhere systems that operate on a point or two-dimensional basis do not achieve the desired results, 3D sensors are used.

Convince yourself: we would be happy to show you the outstanding features and application possibilities of 3D sensors.



#### **Author**

**Ulrich Balbach** studied electrical engineering and has been employed by Leuze electronic GmbH + Co. KG in Owen since 1998. As a company officer, he directs the Optoelectronic Sensors Division and is very involved with VDMA, where, as chairman of the "Electrical Automation" board, he represents sensor systems in machinery construction in a number of committees.

#### **Press inquiries**

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