Presence checking and edge detection are among the main applications for traditional photoelectric sensors, and yet point detection of objects using the single light beam from a diffuse or through-beam sensor hardly exhausts all the possibilities. If you need additional information – such as size, shape or exact edge position of an object within the total area – light bands are the best choice. Balluff offers light array sensors in various versions depending on the requirement profile: from the simple Light Array from the Micromote® family with separate amplifier to the analog fork sensor with integrated processing circuitry to the laser Light Array for high-precision detection of object edges. Each of these solutions performs specific tasks in an ideal way.

The benefits:
Photoelectric light array sensors enable simple, space-saving and perfect object edge detection. They replace cumbersome and complicated combinations of individual photoelectric sensors or expensive image processing. Easy to install and adjust, they are available for any accuracy requirement. Another benefit: They reduce wiring and installation costs. One simple electrical connection is all it takes.

Edge detection control is a typical application for light array sensors
Position measurements of the object edge – generally of fast-moving film-like or woven roll material – are used to control the drives and feed mechanisms in production equipment. The values determined are used to ensure the most even and straight feeding of the material.

The signal output by the sensor can be directly converted into the edge position, making it available for measurement and control processes in the system controller. You can choose from various output formats, including analog voltage and current or IO-Link.

Laser light array sensors allow even transparent materials to be monitored, since the degree of transparency of the objects can be compensated for to a certain degree. As transparency increases the achievable absolute measuring accuracy is reduced, but by nature of the operating principle, much less than with LED sensors.
Function principle of LED light-bands

With LED light-bands individual light beams from adjacent LEDs are arranged to overlap for a very even total area of light intensity. Objects inside this band generate signals which, like traditional presence monitoring are a function of their size and not their position. With single-size edge shadowing, one can derive the edge position by closely approximating a linear measurement. Using this together with the principle of light quantity measurement, edge detection with an accuracy of approx. 0.1 mm is possible. This is because outside influences such as contamination can be compensated for to a certain degree. Balluff uses this function principle in the analog fork sensor and in the Micromote® light-bands with separate amplifier.

The high-precision Laser Light Array works entirely differently. By using optical means to spread a laser beam out into a highly parallel band, the latter can be projected onto a CCD line sensor in the receiver unit. The combination of laser and CCD results in an overall accuracy of > 0.01 mm, even over an emitter-receiver distance of up to 2 m. Unlike LED light-bands, the geometric information is created directly, which makes it usable for generating different functions. In addition to the edge position, the object diameter and other values can be determined, with contamination much less critical in such a system. The Balluff Light Array, based on this innovative technology, opens up a broad pallet of possible applications and makes additional controllers or operating devices superfluous.

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Type | Laser Light Array | Fork sensor | Light Array | Analog amplifier
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BLA0001 | BGL0039 | BOH002M | BAE00NH
Lighting strip width | 50 mm | 80 mm
Fork width/depth | 50 × 54 mm
Emitter, light type | Laser 650 nm | Red light | LED, infrared
Power indicator | Green LED
Function indicator |Yellow LED / 3-digit display
Wavelength | 633 Nm | 950 Nm
Degree of protection as per IEC 60529 | IP65 | IP67 | IP65 | IP54
Ambient temperature T_a | +5...+55 °C | −5...+55 °C | −10...+55 °C | −10...+55 °C