# Fiber Optic Sensors

Photoelectric fiber optic sensors (designated by an "LL," as in the WLL 1000), include the sender and receiver in the same housing. By using flexible plastic or glass fiber optic cables, the sensor can reach application areas that are inaccessible to standard photoelectric sensors. Fiber optic cables can be used in harsh environments that might be damaging to some photoelectric devices, for instance at temperatures as high as 300°C (572°F), or in areas with heavy vibration or corrosive substances.

**Fig. 1** Photoelectric fiber optic sensor

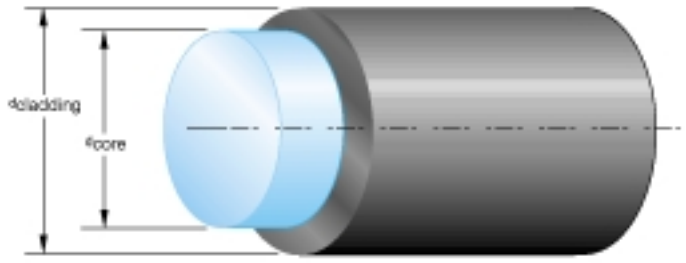


**Fig. 2** Fiber optic cross section

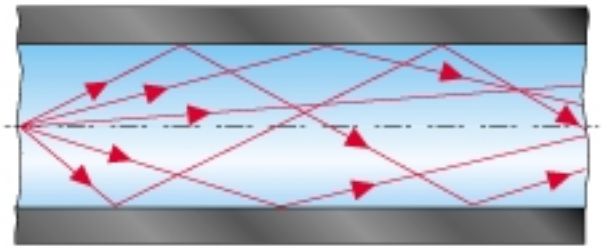

**Fig. 3** Light propagation in a fiber optic cable

Fiber optic cables consist of a high-refractive-index core with a low-refractive-index coating, also referred to as the "cladding". Propagation of light in the transparent core takes place on the principle of total reflection.

Light beams meeting the core/cladding boundary at an angle greater than the limiting angle of total reflection are reflected back into the core. They are therefore propagated to the other end of the fiber following a kind of zigzag path.

To allow fiber optic cables to be flexible on the one hand and still transmit large beam cross-sections, fiber optic cables often consist of bundles of individual fibers.