

New Technology for Fire and Motion Detectors Ensures Enhanced Safety — and No False Alarms

Security systems in buildings must function reliably and, if possible, without any false alarms. This is the specialist field of Dr. Kurt Müller, 63, of Siemens Building Technologies in Zug, Switzerland. In the course of his career, he has refined a number of security systems, in addition to being responsible for 34 inventions, 18 of which have been patented.

Fire alarms in buildings often feature a system of flashing lights that blink at a frequency of between one and two seconds, thus warning people in the building in the event of a fire alarm. In a further development of this principle, Müller has now developed an improved type of flashing light for a new series of fire alarm systems from Siemens. In addition to being visible from any angle, this light also features low power consumption — an important consideration, since a large number of these lights have to be connected to the power network via a two-wire circuit, or “detector bus”. So in addition to the circuit, Müller opted to use light-emitting diodes (LEDs), which not only use very little electricity but also have such a long life that they almost never have to be replaced. Another crucial advantage of Müller’s flashing light — the “Sinteso-Beacon” — is that the light signal remains visible in large, low rooms and spaces such as corridors.

This is because reflectors positioned behind the six LEDs in each unit also ensure that the light is diffused laterally. It is therefore easier for a person to perceive it from an obtuse angle than if the light would shine directly below. What’s more, no extra costs are involved in the manufacture of the new flashing light, since the reflectors are simultaneously produced in the injection-molding process used to make the LED mount.

“I also made use of an evolutionary property of the human eye,” reveals Müller. This is a phenomenon whereby movements at the edges of the field of vision, which at an earlier stage of human history often signified danger, are registered especially quickly by the eye. In order to exploit this property, the six LEDs illuminate consecutively at intervals of milliseconds. This image thus produced on the retina corresponds to the

effect when movement is perceived out of the corner of the eye, thus attracting attention to the light.

Another invention from Müller has reduced the incidence of false alarms with “passive infrared” motion detectors (PIRs), which are used to protect properties against intruders. These detectors react to thermal radiation from moving objects such as people and pets. By means of segmented mirrors, which transmit the thermal radiation to a sensor, they are able to define active zones within the room under surveillance. As soon as a warm object passes through an active zone, an alarm is activated. Müller’s innovation was to incorporate a triplex mirror in the PIR, which also divides the active zones into three different levels. The optical opening of the individual subzones is constructed in such a way that, for example, a dog of approximately 60 centimeters in height and 80 centimeters in length emits a signal that remains fairly constant through the entire active zone and thus does not trigger the alarm. By contrast, a person walking upright emits a stronger signal and can therefore be clearly distinguished from an animal. As a result, the intruder detection system continues to function reliably even when pets are left behind in the property being monitored.