



Developments in Flame Detection

Development of sensors

End of the sixties the development of automatic fire alarm sensors began. Electro-mechanical sensors already existed, such as temperature- and pressure-transmitters. The first automatic fire sensors were based on bimetals and determined a fire by measuring the (rising) temperature gradient of a fire. For the measurement of light, smoke, gas and so on, specific sensors are necessary. Because of the developments in semiconductor components the new sensors could determine physical phenomena from the background. Complex electrical integrated circuits (ICs) enabled the product developers to transform the signals of the sensors into a useful alarm.

Miniaturization

End of the seventies the themes „unwanted alarm suppression“ and „miniaturizing“ were important. The sensors were able to measure, but were not very selective. With help of miniaturizing the sensors became cheaper and this initialized an increase in the demand. Because of the high production volumes the sensors became even cheaper and the market was saturated with a wide range of sensors; not all of them had the same high quality. The consequence was a high amount of unwanted alarms and the demand for regulation for product requirements, planning projecting, and maintenance of fire alarm systems.

Intelligent signal processing and multi-sensors

End of the eighties the intelligent signal processing was introduced. This was made possible by the quick developments in the processor industry. Algorithms gave the possibility to process the signals in a complex way and therewith enhance the reliability. The technique became nice names like “Fuzzy Logic”. “Self-learning software” (“neural networks”) were able to suppress unwanted alarms in a spectacular way. Next to the use of multi-sensors was the border between the suppression of unwanted alarms and the neglect of real fires however unpleasantly small. It occurred that real fires were not detected, because they presented themselves in a way, which was not expected by the product developers.

New sensors technology

End of the nineties the industry understood that the sensors did lack an insufficient intelligence and did not fully utilize the capabilities of the powerful processors. A human being observes events by means of the senses, like feeling, hearing, seeing, smelling and tasting. From these the visible information is the most important for the diagnose of the size of a fire. The alternative for the human eye is the camera. By processing the image material one has a wide variety of sensors. Each pixel is in fact a sensor. With the information of these pixels the processor can make its calculations. The video technology has had a significant progress and compression techniques are improving very fast. The first camera detection observed unwanted persons, without the necessity to let the security guard focus on the monitor continuously. By means of movement analysis of the pixels in the camera image, one can even determine if a person is moving in a suspect way through a crowd. Face recognition is today very common, and also traffic management systems with cameras and computer. The human being at highest makes the decisions.

Alarm verification

Today, there is demand for quick verification of alarms with human causes, because the systems are not (yet) able to make their decisions independently. And may-be this is undesirable. The decisions should be taken in your organization. The rise of (mobile) internet enables sending images, sound and even video real-time all over the world. Alarms can be sent to smart phones, to enable the expert (for example a fire fighter) to judge, what is the right response.