**Function of Sensors**

The functions of an intelligent sensor system can be described in terms of compensation, information processing, communications and integration. The combination of these respective elements allow for the development of these sensors that can operate in a multi-modal fashion as well conducting active autonomous sensing.

**Compensation** is the ability of the system to detect and respond to changes in the network environment through self-diagnostic routines, self-calibration and adaptation. A smart sensor must be able to evaluate the validity of collected data, compare it with that obtained by other sensors and confirm the accuracy

**Information processing** encompasses the data related processing that aims to enhance and interpret the collected data and maximize the efficiency of the system, through signal conditioning, data reduction, event detection and decision making.

**Communications**component of sensor systems incorporates the standardized network protocol which serves to links the distributed sensors in a coherent manner, enabling efficient communications and fault tolerance.

**Integration** in smart sensors involves the coupling of sensing and computation at the chip level. This can be implemented using micro electro-mechanical systems (MEMS), nano-technology and bio-technology.

**Validation** of sensors is required to avoid the potential disastrous effects of the propagation of erroneous data. The incorporation of data validation into smart sensors increases the overall reliability of the system.

**Data fusion** techniques are required in order combine information from multiple sensors and sensor types and to ensure that only the most relevant information is transmitted between sensors.