Introduction to IEEE P1451 Standards

Transducers, defined here as sensors or actuators, serve a wide variety of industry's needs, manufacturing, industrial control, automotive, aerospace, building, and biomedicine are but a few. Since the transducer market is very diverse, transducer manufacturers are seeking ways to build low-cost, networked, and wireless smart transducers. Many sensor control networks or fieldbus implementations are currently available, each with its own strengths and weaknesses for a specific application class. Interfacing the smart transducers to all of these control networks and supporting the wide variety of protocols require very significant efforts and are costly to transducer manufacturers. However, using digital communication schemes, networked or wireless transducers can eliminate a large number of lengthy parallel analog wiring and thus reduces the installation, maintenance, and upgrade costs of sensor-based systems. And the use of microprocessors to handle the digital communication has also opened the opportunity for adding intelligence to sensors and actuators. One problem for transducer manufacturers though, is the large number of wired and wireless networks on the market today. Currently, it is too costly for transducer manufacturers to make unique smart transducers for each network on the market. Therefore a universally accepted set of open standards, like the suite of IEEE 1451 smart transducer interface standards for sensors and actuators, are developed to address these issues.

Objective of IEEE 1451

The objective of this project is to develop a family of smart transducer interface standard IEEE 1451. This set of standards is to make it easier for transducer manufacturers to develop smart devices and to interface those devices to networks, systems, and instruments by incorporating existing and emerging sensor- and networking technologies.

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