



IEEE Standard for A Smart Transducer Interface for Sensors and Actuators—Transducers to Radio Frequency Identification (RFID) Systems Communication Protocols and Transducer Electronic Data Sheet Formats

IEEE Instrumentation and Measurement Society

Sponsored by the
TC9 Sensor Technology (IM/ST) Committee

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Abstract: Data formats designed to facilitate communications between radio frequency identification (RFID) systems and smart RFID tags with integral transducers (sensors and actuators) are introduced in this standard. New transducer electronic data sheet (TEDS) formats for smart RFID tags, based on the IEEE 1451 family of standards, are defined. Also, a comprehensive command set for smart RFID tags is defined.

Keywords: network capable application processor (NCAP), radio frequency identification (RFID) tag, sensor command, sensor integration, sensor interface, sensor standard, smart RFID tags, transducer electronic data sheet (TEDS), transducer interface module (TIM)

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Introduction

This introduction is not part of IEEE Std 1451.7-2010, IEEE Standard for Smart Transducer Interface for Sensors and Actuators—Transducers to Radio Frequency Identification (RFID) Systems Communication Protocols and Transducer Electronic Data Sheet Formats.

This standard describes communication methods and data formats, and it provides a transducer electronic data sheet (TEDS) for sensors working in cooperation with radio frequency identification (RFID) systems. This document does not outline, recommend, or prescribe any specific air-interface protocol. This document is intended to be air-interface agnostic.

This standard is the seventh member of the IEEE 1451 family of standards. In the IEEE 1451 family, transducers (sensors or actuators) are connected to a transducer interface module (TIM), which is connected to a network capable application processor (NCAP) to allow network access of transducer data. IEEE Std 1451.0™-2007 [B1]^a defined a set of common functionality, commands, and TEDS for the family of IEEE 1451 smart transducer standards. IEEE Std 1451.1™-1999 [B2] defined a smart transducer object model and communication methods to facilitate the access of smart transducer in a network. IEEE Std 1451.2™-1997 [B3] defined serial interfaces for connecting transducer modules to a network processor. IEEE Std 1451.3 [B4] defined a transducer interface for distributed multidrop systems. IEEE Std 1451.4™-2004 [B5] defined a mixed-mode transducer interface that allows the transfer of digital transducer electronic data sheet and analog sensor signals on the same wires. IEEE Std 1451.5™-2007 [B6] defined a wireless communication interface for connecting transducers using various wireless communication protocols.

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^aThe numbers in brackets correspond to those of the bibliography in Annex F.

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1. Overview

1.1 Scope

This standard defines data formats to facilitate communications between radio frequency identification (RFID) systems and smart RFID tags with integral transducers (sensors and actuators). The standard defines new transducer electronic data sheet (TEDS) formats based on the IEEE 1451 family of standards. This standard also defines a command structure and specifies the communication methods with which the command structure is designed to be compatible.