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Information technology — Smart transducer interface for sensors and actuators —

Part 7: Transducer to radio frequency identification (RFID) systems communication protocols and Transducer Electronic Data Sheet (TEDS) formats

Technologies de l'information — Interface de transducteurs intelligente pour capteurs et actuateurs —

Partie 7: Protocoles de communication entre capteurs et systèmes d'identification par radiofréquence (RFID) et feuilles de données électroniques du transducteur (TEDS)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of ISO/IEC JTC 1 is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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ISO/IEC/IEEE 21451-7 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*, in cooperation with the Technical Committee on Sensor Technology (TC9) of the IEEE Instrumentation and Measurement Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

ISO/IEC/IEEE 21451 consists of the following parts, under the general title *Information technology — Smart transducer interface for sensors and actuators*:

— *Part 1: Network Capable Application Processor (NCAP) information model*

— *Part 2: Transducer to microprocessor communication protocols and Transducer Electronic Data Sheet (TEDS) formats*

— *Part 4: Mixed-mode communication protocols and Transducer Electronic Data Sheet (TEDS) formats*

— *Part 7: Transducer to radio frequency identification (RFID) systems communication protocols and Transducer Electronic Data Sheet (TEDS) formats*

Introduction

This part of ISO/IEC/IEEE 21451 describes communication methods, data formats and provides a Transducer Electronic Data Sheet (TEDS) for sensors working in cooperation with radio frequency identification (RFID) systems. This part of ISO/IEC/IEEE 21451 does not outline, recommend, or prescribe any specific air-interface protocol. This part of ISO/IEC/IEEE 21451 is intended to be air-interface agnostic.

In the ISO/IEC/IEEE 21451 series of standards, 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. ISO/IEC/IEEE 21450 defines a set of common functionality, commands, and TEDS for the ISO/IEC/IEEE 21451 series of smart transducer standards.

ISO/IEC/IEEE 21450 provides a common basis for members of the ISO/IEC/IEEE 21451 series of standards to be interoperable. It defines the functions that are to be performed by a TIM and the common characteristics for all devices that implement the TIM. It specifies the formats for TEDS. It defines a set of commands to facilitate the setup and control of the TIM as well as reading and writing the data used by the system. Application programming interfaces (APIs) are defined to facilitate communications with the TIM and with applications. ISO/IEC/IEEE 21451-1 defines a smart transducer object model and communication methods to facilitate the access of smart transducers in a network. ISO/IEC/IEEE 21451-2 defines serial interfaces for connecting transducer modules to a network processor. ISO/IEC/IEEE 21451-4 defines a mixed-mode transducer interface that allows the transfer of digital transducer electronic data sheet and analogue sensor signals on the same wires.

Information technology — Smart transducer interface for sensors and actuators —

Part 7:
Transducer to radio frequency identification (RFID) systems communication protocols and Transducer Electronic Data Sheet (TEDS) formats

1 Scope

This part of ISO/IEC/IEEE 21451 defines communication methods and data formats for transducers (sensors and actuators) communicating with RFID tags. This part of ISO/IEC/IEEE 21451 also defines Transducer Electronic Data Sheet (TEDS) formats based on the ISO/IEC/IEEE 21451 series of standards and protocols for accessing TEDS and transducer data. It adopts necessary interfaces and protocols to facilitate the use of technically differentiated, existing technology solutions. It does not specify transducer design or signal conditioning.

There is currently no openly defined independent interface standard between transducers and RFID tags. Each vendor builds its own interface. Without such a standard, transducer interfacing and integration to RFID tags and systems are time-consuming and all vendors' duplicated efforts are economically unproductive. The purpose of this part of ISO/IEC/IEEE 21451 is to provide interfaces and methods for interfacing transducers to RFID tags and reporting transducer data within the RFID infrastructure. It also provides the means for device and equipment interoperability.

2 Conformance

Conformance to this part of ISO/IEC/IEEE 21451 requires that all non-optional sections be implemented in the vendor device.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 19762 (all parts), *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

IEEE Std 100-2000, *The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition*