
P1451.5.6

Type of Project: New IEEE Standard
Project Request Type: Initiation / New
PAR Request Date: 17 Mar 2021
PAR Approval Date: 21 May 2021
PAR Expiration Date: 31 Dec 2025
PAR Status: Active

1.1 Project Number: P1451.5.6
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: Standard for a Smart Transducer Interface for Sensors and Actuator -- Wireless Communication Protocols and Transducer Electronic Data Sheet (TEDS) Formats – Sigfox Protocol

3.1 Working Group: 1451.5.6 Working Group(IES/IES/1451.5.6 WG)

3.1.1 Contact Information for Working Group Chair:

Name: Kim Fung Tsang

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3.1.2 Contact Information for Working Group Vice Chair:

None

3.2 Society and Committee: IEEE Industrial Electronics Society/Industrial Electronics Society Standards Committee(IES/IES)

3.2.1 Contact Information for Standards Committee Chair:

Name: Cheng-Jen Chen

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3.2.2 Contact Information for Standards Committee Vice Chair:

None

3.2.3 Contact Information for Standards Representative:

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3.3 Co-Stds Committee(s):

3.3.1 IEEE Instrumentation and Measurement Society/TC9 - Sensor Technology (IM/ST)

Contact Information for Standards Committee Chair:

Name: Kang Lee

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4.1 Type of Ballot: Individual

4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Dec 2023

4.3 Projected Completion Date for Submittal to RevCom: Sep 2024

5.1 Approximate number of people expected to be actively involved in the development of this project: 20

5.2 Scope of proposed standard: This project defines a standardized system design for a smart sensor interface using the long-range ultra narrowband Sigfox protocol. A Sigfox system includes end devices, gateways, network servers, and application servers. The standard defines the design and specifications of smart sensor interface adopting the Sigfox protocol to achieve data accuracy, interoperability (plug-and-play) based on the IEEE 1451.0 transducer services, data privacy, and harmonized performance of Sigfox systems. This standard includes the wireless transducer interface module (WTIM) (end devices), network capable application processor (NCAP) (gateway device, or 1451 server), and application (1451 client), and appropriate transducer electronic data sheet (TEDS). The standard also defines the Application Programming Interfaces (APIs) between WTIM and NCAP (1451 server) and harmonized radio frequency planning. This standard provides guidance to improve data accuracy, privacy, and quality-of-services (QoS).

5.3 Is the completion of this standard contingent upon the completion of another standard? Yes

Explanation: IEEE P1451.0 and IEEE P1451.5 (refer to section 8.1).

5.4 Purpose: This standard provides a unique, transparent, efficient, and experienced design structure for developing Sigfox smart sensor system interface. The standard consists of four major developments, namely data accuracy, interoperability (plug-and-play), privacy and harmonization of Sigfox systems, and manifest

guidance on improving the overall performance of various applications with standardized interface design. The establishment of the standard aims to facilitate the rapid, positive, and standardized progress of Internet-of-Things (IoT) industry.

5.5 Need for the Project: Sigfox is a kind of low-power wide-area network (LPWAN) operating in unlicensed bands. The receiver sensitivity of Sigfox is better than -140 dBm, the operation range is much longer than typical wireless and mobile telephony protocols. Thus, Sigfox is considered as long range. The bandwidth of Sigfox can be configured to as narrow as 600Hz, thus it is ultra-narrow band. In addition, the short payload design of Sigfox achieves low power consumption, which facilitates the deployment of battery-powered devices. In summary, Sigfox is long range, ultra-narrow band and low power. Nonetheless, devices operating in unlicensed bands encounter signal collision when a large number of devices communicate simultaneously without any coordination/harmonization. Besides, the interoperability and privacy of Sigfox devices may influence practicability and threaten functional failure if there are no standardized measures for Sigfox smart sensors. This standard aims at standardizing a common Sigfox smart sensor interface, from the radio physical layer to the network layer. The standard aims at data accuracy, plug-and-play, privacy, and harmonization in Sigfox systems and/or applications.

5.6 Stakeholders for the Standard: Manufacturers and users of IoT products, personal computers, enterprise networking devices, consumer electronic devices, and home networking equipment; Producers of industrial sensors, and mobile devices; Cellular operators and equipment manufactures; Vehicle manufacturers; Private / public sectors, enterprise infrastructure providers; and other wireless operators.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?

No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?

No

7.1 Are there other standards or projects with a similar scope? No

7.2 Is it the intent to develop this document jointly with another organization? No

8.1 Additional Explanatory Notes: IEEE P1451.0 and IEEE P1451.5 are targeted to be completed by end of December 2021.

P1451.0, Standard for a Smart Transducer Interface for Sensors, Actuators, Devices, and Systems - Common Functions, Communication Protocols, and Transducer Electronic Data Sheet (TEDS) Formats.

Source: IMS TC-9 P1451.0 Working Group

P1451.5, Standard for a Smart Transducer Interface for Sensors and Actuator - Wireless Communication Protocols and Transducer Electronic Data Sheet (TEDS) Formats.

Source: IMS TC-9 P1451.5 Working Group