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Foreword

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*.

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Introduction

Sensor network is widely used around the world in multiple fields such as industrial automation, environment monitoring, smart home, intelligent health-care and smart grid. The applications can involve different devices supplied by different manufacturers, e.g. sensors, actuators, controllers, routers and gateways, etc. Data can be collected and processed by use of different wired/wireless communication technologies. Thus, various test systems should be employed to satisfy some specific requirements. The operations of test systems is a challenge to users, if without a uniform test platform.

When designing and developing a sensor network test system, the characteristics regarding the following aspects should be considered:

a) Sensor network heterogeneity. It is necessary to verify the interoperability of sensor networks based on different protocols prior to system application;

b) Diversity of sensor network applications.

However, an international test standard for sensor networks which can provide guidance to design and develop a uniform platform integrating different tests for sensor networks is still unavailable.

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Information technology — Sensor network testing framework

1 Scope

This document specifies:

— testing framework for conformance test for heterogeneous sensor networks,

— generic services between test manager (TMR) and test agent (TA) in the testing framework, and

— guidance for creating testing platform and enabling the test of different sensor network protocols.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
analysis module
logical unit within a testing application process which is used to analyse the information from test agent and module-based test depending on a particular strategy

3.2
test agent
device designed for different sensor network protocols or various kinds of hardware that can communicate directly with the test manager and the systems under test

3.3
testing application process
software functional entity that performs the processing by combining test modules, analysis modules and report modules to fulfil test purposes

Note 1 to entry: It is an application platform that supervises various operational aspects of testing activities and entities, usually through interaction with test agents.

3.4
test module
logical unit within a testing application process that performs operations depending on a specified testing requirements

3.5
testing platform
testing entity that could integrate different test systems for different protocols and technologies

EXAMPLE A platform can provide IPv4 and IPv6 conformance testing systems.

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3.6
test report
logical unit of software within a testing application process that produces documents at the end of test assessment

3.7
view object
logical element provided to support efficient access to data within a testing or analysis module

Note 1 to entry: It is visible on graphic user interfaces.

4 Abbreviated terms

TE	auxiliary testing equipment
DUT	device under test
ICS	implementation conformance statement
IUT	implementation under test
MIB	management information base
OD	object dictionary
SAPs	service access points
SNTF	sensor network testing framework
SUT	system under test
TA	test agent
TAP	testing application process
TDSs	testing data services
TM	test module
TMR	test manager
TMSs	testing management services
TP	test purpose
VO	view object

5 Overview of a sensor network testing framework (SNTF)

5.1 Testing requirements of sensor networks

Varied with applications, sensor networks are likely employ different communication technologies and protocols. To ensure their interconnection and operation, it is required to deploy a great number of test systems, which are designed to test individual technologies and protocols with regard to protocol conformance. Therefore, it is a challenging task to integrate the variety of the test systems for sensor networks.

It is difficult to manage different test systems, make them work together and execute test cross various technologies and protocols for specific user requirements. Various application systems need different communication interfaces and protocols, which can't interact directly with each other.

With changing testing requirements, test system for sensor networks should be scalable and adaptable on demand. For example, when new sensor networks are added into the application, the corresponding test systems should be integrated into the test platform with low costs.

Annex A describes an example of a testing platform for hybrid sensor networks based on IPv6.

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