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Information technology — Real-time locating system (RTLS) device performance test methods —

Part 5: Test methods for chirp spread spectrum (CSS) air interface

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques.*

A list of all parts in the ISO/IEC 24770 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

ISO/IEC 24730-5 defines an air interface for real time locating systems (RTLS) devices used in asset management applications.

This document provides test methods for measuring the performance of equipment compliant with ISO/IEC 24730-5.

ISO/IEC 24769-5 contains all measurements required to be made on a product in order to establish whether it conforms to ISO/IEC 24730-5.

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Information technology — Real-time locating system (RTLS) device performance test methods —

Part 5: Test methods for chirp spread spectrum (CSS) air interface

1 Scope

This document defines the test methods for determining the performance characteristics of chirp spread spectrum (CSS) real time locating system (RTLS) equipment including tags and readers which are applicable to the selection of equipment that conforms to ISO/IEC 24730-5 for specific applications. This document does not apply to the testing in relation to regulatory or similar requirements.

The RTLS equipment performance parameters included in this document only include the chirp spread spectrum (CSS) radio frequencies link between tags and readers. Unlike ISO/IEC 18305, the tests in this document apply exclusively to RTLS equipment defined in ISO/IEC 24730-5 unless specified otherwise.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

ISO/IEC 24730-5, *Information technology — Real-time locating systems (RTLS) — Part 5: Chirp spread spectrum (CSS) at 2,4 GHz air interface*

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762 apply.

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

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

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

3.2 Abbreviated terms

CSS	chirp spread spectrum
RF	radio frequency
RTLS	real time locating system

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TDOA time difference of arrival

TOA time of arrival

TOF time of flight

4 General

4.1 Performance requirements

4.1.1 Overview

This document specifies a series of tests to determine the performance characteristics of RTLS equipment relative to the ISO/IEC 24730-5 air interfaces. The results of these tests can be used to determine the suitability of RTLS equipment for applications.

4.1.2 Location accuracy

The primary function of RTLS equipment is to locate tags within the area determined by the readers. Location accuracy determines the primary performance criteria of an RTLS. Location accuracy can be characterized by comparing the system's calculated location for a given set of tags to the actual location of the tags. The system shall be able to locate tags to within the applications allowable error. In many, but not necessarily in all applications, the Euclidean distance between the calculated location of a tag and the actual location of a tag can be used as an error criterion. The location tests specified in this document are confined to line-of-sight situations. Although this is not be applicable to all applications, the complexity of all the variations of blockage and partial blockage are beyond the scope of this test.

4.1.3 Tag capacity

An RTLS shall typically locate a large number of tags. The number of tag blinks per second that can be processed and located through the readers can be used to determine a system’s tag capacity. The system shall be able to provide location information for an applications peak tag blink density.

4.1.4 Location latency

The latency between when the tag blink is transmitted and, when the RTLS equipment can provide accurate location information, determines the suitability of the equipment for the application.

4.1.5 Tag orientation

The ability of an RTLS to provide real time location information should be independent of the orientation of the tag. The location reported by the RTLS should stay within the applications allowable error as the tag is rotated in any orientation relative to the readers.

4.1.6 System range and packet error rates

The length of the tag-reader link (system range) determines the reader density requirements and also affects system capacity. The packet error rate determines how often the equipment can successfully provide accurate location information for the tag. The maximum range at which a certain packet error rate is observed determines the usability of the system in meeting the applications requirements.

4.2 Default conditions applicable to the test methods

4.2.1 Overview

These conditions apply to all tests.

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