INTERNATIONAL STANDARD

ISO/IEC 24730-2

First edition
2006-12-15

Information technology — Real-time locating systems (RTLS) —

Part 2: 2,4 GHz air interface protocol

Technologies de l'information — Systèmes de localisation en temps réel —

Partie 2: Protocole d'interface d'air à 2.4 GHz

Reference number
ISO/IEC 24730-2:2006(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

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

The main task of the joint technical committee 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24730-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

ISO/IEC 24730 consists of the following parts, under the general title *Information technology — Real-time locating systems (RTLS)*:

— *Part 1: Application program interface (API)*

— *Part 2: 2,4 GHz air interface protocol*

Introduction

ISO/IEC 24730 defines two air interface protocols and a single application program interface (API) for real-time locating systems (RTLS) for use in asset management and is intended to allow for compatibility and to encourage interoperability of products for the growing RTLS market.

This part of ISO/IEC 24730, the 2,4 GHz air interface protocol, establishes a technical standard for real-time locating systems that operate at an internationally available 2,4 GHz frequency band and that are intended to provide approximate location with frequent updates (for example, several times a minute). In order to be compliant with this standard, compliance with this part of ISO/IEC 24730 and ISO/IEC 24730-1 is required.

Real time locating systems are wireless systems with the ability to locate the position of an item anywhere in a defined space (local/campus, wide area/regional, global) at a point in time that is, or is close to, real time. Position is derived by measurements of the physical properties of the radio link.

This part of ISO/IEC 24730 specifies the air interface for a system that locates an asset in a controlled area, e.g. warehouse, campus, airport (area of interest is instrumented) - accuracy to 3 m.

There are a further two methods of locating an object which are really RFID rather than RTLS:

— Locating an asset by virtue of the fact that the asset has passed point A at a certain time and has not passed point B.

— Locating an asset by virtue of providing a homing beacon whereby a person with a handheld can find an asset.

The method of location is through identification and location, generally through multi-lateration. The different types are

— Time of Flight Ranging Systems,

— Amplitude Triangulation,

— Time Difference of Arrival (TDOA),

— Angle of Arrival.

This part of ISO/IEC 24730 defines the air interface protocol needed for the creation of an RTLS system. There are many types of location algorithms that could be used. An example of a location algorithm is given in Annex A.

Information technology — Real-time locating systems (RTLS) —

Part 2:
2,4 GHz air interface protocol

1 Scope

This part of ISO/IEC 24730 defines a networked location system that provides X-Y coordinates and data telemetry. The system utilizes RTLS transmitters that autonomously generate a direct-sequence spread spectrum radio frequency beacon. These devices may be field programmable and support an optional exciter mode that allows modification of the rate of location update and location of the RTLS device. ISO/IEC 24730 also defines these modes, but does not define the means by which they are accomplished.

2 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 24730-1, *Information technology — Real-time locating systems (RTLS) — Part 1: Application program interface (API)*

ISO/IEC 18000-4, *Information technology — Radio frequency identification for item management — Part 4: Parameters for air interface communications at 2,45 GHz*

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*

ISO/IEC 19762-3, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 3: Radio frequency identification (RFID)*

ISO/IEC 15963, *Information technology — Radio frequency identification for item management — Unique identification for RF tags*

ISO/IEC 8802-11:2005, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1, ISO/IEC 19762-3 and the following apply.

3.1
air interface
wireless communications protocol and signal structure used to communicate data between RTLS transmitters and other RTLS devices