INTERNATIONAL STANDARD

ISO 18185-1

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Freight containers — Electronic seals —

Part 1: Communication protocol

Conteneurs pour le transport de marchandises — Scellés électroniques —

Partie 1: Protocole de communication

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member 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 shall not be held responsible for identifying any or all such patent rights.

ISO 18185-1 was prepared by Technical Committee ISO/TC 104, *Freight containers*, Subcommittee SC 4, *Identification and communication*.

ISO 18185 consists of the following parts, under the general title *Freight containers — Electronic seals*:

— *Part 1: Communication protocol*

— *Part 2: Application requirements*

— *Part 3: Environmental characteristics*

— *Part 4: Data protection*

— *Part 5: Physical layer*

Introduction

The communication protocol for an electronic seal for freight containers has been developed by the committee to provide for the data link requirements related to the unambiguous interrogation and maintenance of the integrity of a freight container seal from point of sealing to point of opening.

Freight containers — Electronic seals —

Part 1: Communication protocol

1 Scope

This part of ISO 18185 provides a system for the identification and presentation of information about freight container electronic seals. The identification system provides an unambiguous and unique identification of the container seal, its status and related information.

The presentation of this information is provided through a radio-communications interface providing seal identification and a method for determining whether a freight container's seal has been opened.

This part of ISO 18185 specifies a read-only, non-reusable freight container seal identification system, with an associated system for verifying the accuracy of use, having

— a seal status identification system,

— a battery status indicator,

— a unique seal identifier including the identification of the manufacturer,

— the seal (tag) type.

This part of ISO 18185 is used in conjunction with the other parts of ISO 18185.

It applies to all electronic seals used on freight containers covered by ISO 668, ISO 1496-1 to ISO 1496-5, and ISO 8323. Wherever appropriate and practicable, it also applies to freight containers other than those covered by these International Standards.

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/TS 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 17712, Freight containers — Mechanical seals

ISO 18185-2, *Freight containers — Electronic seals — Part 2: Application requirements*

ISO 18185-5, *Freight containers — Electronic seals — Part 5: Sensor interface*

ISO/IEC 18000-7, *Information technology — Radio frequency identification for item management — Part 7: Parameters for active air interface communications at 433 MHz*

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

ISO/IEC 19762-2, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*

ISO/IEC 24730-2, *Information technology — Real-time locating systems (RTLS) — Part 2: 2,4 GHz air interface protocol*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1, ISO/IEC 19762-2, ISO 17712 and the following apply.

3.1
electronic seal
eSeal
read-only, non-reusable freight container seal conforming to the high-security seal defined in ISO 17712 and conforming to ISO 18185 or revision thereof that electronically evidences tampering or intrusion through the container doors

3.2
seal identification
Seal ID
unique identification of each manufactured seal incorporating serial number (i.e. Tag ID) and manufacturer ID

3.3
interrogator identification
Interrogator ID
code used to identify the source address during every communication session originated by the interrogator

3.4
low frequency transmitter
LF transmitter
device that emits a short range magnetically coupled signal

3.5
Short Range Link
SRL
low frequency link using the low frequency magnetically coupled signalling

3.6
Long Range Link
LRL
radio frequency link using 433,92 MHz or 2,4 GHz signalling

3.7
localization
capability in any operational scenario to associate an eSeal to the container onto which it is affixed

4 Common requirements

The seal shall be uniquely identified by the tag manufacturer ID and the tag ID (serial number) combination. This combination shall be called seal ID and shall be used in all point-to-point communication to uniquely identify a source (seal to interrogator) and destination address (interrogator to seal).

The seal ID is permanently programmed into the seal during manufacturing and cannot be modified.