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Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to Automatic Identification and Data Capture (AIDC)

Techniques automatiques de la saisie d'identification et de données (AIDC)— Vocabulaire harmonisé — Partie 1: Limites générales concernant la saisie automatique d'identification et de données (AIDC)

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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.

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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.

ISO/IEC 19762 was prepared by ISO/IEC JTC 1/SC 31 – Automatic Identification and **Data** Capture Techniques, Vocabulary Rapporteur.

ISO/IEC 19762 consists of the following parts, under the general title *Information technology AIDC techniques - Harmonized vocabulary*:

*Part 1: Information technology, AIDC techniques - Harmonized vocabulary - General terms relating to Automatic Identification and **Data** Capture (AIDC)*

Part 2: Information technology, AIDC techniques - Harmonized vocabulary - Optically Readable Media (ORM)

Part 3: Information technology, AIDC techniques - Harmonized vocabulary - Radio-Frequency Identification (RFID)

Part 4: Information technology, AIDC techniques - Harmonized vocabulary – General terms relating to radio communications

Part 5: Information technology, AIDC techniques - Harmonized vocabulary – Locating systems

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Introduction

ISO/IEC 19762 is intended to facilitate international communication in information technology, specifically in the area of automatic identification and data capture (AIDC) techniques. It provides a listing of terms and definitions used across multiple AIDC techniques.

Abbreviations used within each part of ISO/IEC 19762 and an index of all definitions used within each part of ISO/IEC 19762 is found at the end of each document.

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Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to Automatic Identification and Data Capture (AIDC)

Scope

This part of ISO/IEC 19762 provides general terms and definitions in the area of automatic identification and **data** capture techniques on which are based further specialized sections in various technical fields, as well as the essential terms which should be used by non-specialist users in communication with specialists in automatic identification and **data** capture techniques.

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 19762-2, *Information technology AIDC techniques - Harmonized vocabulary, Part 2 – Optically Readable Media (ORM)*

ISO/IEC 19762-3, *Information technology AIDC techniques - Harmonized vocabulary, Part 3 - Radio-Frequency Identification (RFID)*

ISO/IEC 19762-4, *Information technology AIDC techniques - Harmonized vocabulary, Part 4 – General terms relating to Radio Communication*

ISO/IEC 19762-5, *Information technology AIDC techniques - Harmonized vocabulary, Part 5 – Locating systems*

ISO/IEC 2382-1 *Information technology -- Vocabulary -- Part 1: Fundamental terms*

ISO/IEC 2382-4 *Information technology -- Vocabulary -- Part 4: Organization of data*

ISO/IEC 2382-9 *Information technology -- Vocabulary -- Part 9: Data communication*

ISO/IEC 2382-16 *Information technology -- Vocabulary -- Part 16: Information theory*

IEC 60050-702 *International Electrotechnical Vocabulary - Chapter 702: Oscillations, signals and related devices*

IEC 60050-704 *International Electrotechnical Vocabulary - Chapter 704: Transmission*

IEC 60050-191 *International Electrotechnical Vocabulary. Chapter 191: Dependability and quality of service*

IEC 60050-845 *International Electrotechnical Vocabulary. Lighting*

ISO/IEC Guide 2 Standardization and related activities -- General vocabulary

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Classification of entries

The numbering system employed within ISO 19762 is in the format nn.nn.nnn, in which the first two numbers (***nn***.nn.nnn) represent the "Top Level" reflecting whether the term is related to 01 = Common to All AIDC Techniques, 02 = Common to All Optically Readable Media, 03 = Linear Bar Code Symbols, 04 = Two-dimensional Symbols, 05 = General terms radio, 06 = Radio Frequency Identification, 07 = Real Time Locating Systems, and 08 = MIIM. The second two numbers (nn.***nn***.nnn) represent the "Mid Level" reflecting whether the term is related to 01 = Basic Concepts/Data, 02 = Technical Features, 03 = Symbology, 04 = Hardware, and 05 = Applications. The third two or three numbers (nn.nn.***nnn***) represent the "Fine" reflecting a sequence of terms.

The numbering in this part of ISO/IEC 19762 employs "Top Level" numbers (nn.nn.nnn) of 01

Terms and Definitions

01.01.01
data
reinterpretable representation of information in a formalized manner suitable for communication, interpretation, or processing

cf. information

[ISO/IEC 2382-1:1993 01.01.02]

NOTE 1 **Data** can be processed by humans or by automatic means.

NOTE 2 **Data** can be in the form of numbers and characters for example, to which meaning may be ascribed.

01.01.02
information
(information processing) knowledge concerning objects that within a certain context has a particular meaning

NOTE 1 Facts, events, things, processes, and ideas, including concepts, are examples of objects.

NOTE 2 Information is something that is meaningful. **Data** may be regarded as information once it's meaning is revealed.

[ISO/IEC 2382-1:1993 01.01.01

01.01.03
bit
binary digit
either of the digits 0 or 1 when used in the binary numeration system

01.01.04
information bit
bit used for the representation of user **data**, rather than for control purposes

01.01.05
least significant bit
LSB
bit with the lowest binary value in a group of matching bits

NOTE A **byte** is an example of a group of matching bits.

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01.01.06
most significant bit
MSB
bit with the highest binary value in a group of matching bits

NOTE A **byte** is an example of a group of matching bits

01.01.07
byte(1)
string that consists of a number of bits, treated as a unit, and usually representing a character or a part of a character

[ISO/IEC 2382-4:1999 04.05.08]

01.01.08
byte(2)
sequential series of bits comprising one character and handled as one unit

NOTE 1 The number of bits in a byte is fixed for a given **data** processing system.

NOTE 2 The number of bits in a byte is usually 8.

NOTE 3 A byte is often eight logical **data** bits, but may include **error detection** or correction bits.

[ISO/IEC 2382-16 16.04.13]

NOTE 4 A measure of the transmission capability of a communication **channel** expressed in bits.s-1 and related to channel **bandwidth** and signal to **noise** ratio by the Shannon equation: Capacity, C = B log2 (1 + S/N), where B is the bandwidth and S/N the signal to noise ratio.

cf. Compare Capacity - Data

01.01.09
hexadecimal(1), noun
Hex
method of representing **data** to base 16, using the numbers 0 to 9 and the letters A to F

NOTE Used as a convenient short hand notation for representing 16 and 32 bit **memory** addresses.

EXAMPLE The number 10 is represented in hexadecimal as 'A'.

01.01.10
hexadecimal(2), adj.
characterized by a selection choice, or condition that has sixteen possible different values or states, such as the hexadecimal digits

01.01.11
character
member of a set of elements used by agreement, for the organization, representation or control of information

Note Characters may be letters, digits, punctuation marks or other symbols and, by extension, function controls such as space shift, carriage return or line feed contained in a message

[IEC 60050-702 702-05-10]

01.01.12
data character
single ***numeric*** digit, alphabetic ***character*** or punctuation mark, or control ***character***, which represents information

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01.01.13
character set
finite set of characters that is complete for a given purpose

NOTE ASCII is an example of a character set.

01.01.14
code
collection of rules that maps the elements of a first set onto the elements of a second set

[ISO/IEC 2382-4 04.02.01]

01.01.15
code element
result of applying a code to an element of a coded set

[ISO/IEC 2382-4 04.02.04]

01.01.16
coded character set
coded set whose ***elements*** are single ***characters***

[ISO/IEC 2382-4 04.02.03]

01.01.17
coded set
set of ***elements*** that is mapped onto another set according to a code

01.01.18
numeric
denoting a **character set** that includes only numbers
cf. alphanumeric

01.01.19
alphanumeric
pertaining to **data** that consist of both letters and digits, and may contain other characters such as punctuation marks

01.01.20
digital
pertaining to **data** that consist of digits as well as to processes and functional units that use those **data**

[ISO/IEC 2382-1:1993 01.02.04]
NOTE 1 Represented in a binary form rather than a continuously varying analogue form.

NOTE 2 In the context of integrated artwork, produced by a number of discrete dots rather than a continuous image.

01.01.21
word(1)
set of characters usually comprised of 8, 16, or 32 bits (as used in computers)
cf. word(2)

01.01.22
word(2)
character string or bit string treated as a unit for a given purpose

NOTE The length of a computer word is defined by the computer architecture, while special characters or control characters delimit the words in text processing.

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[ISO/IEC 2382-4 04.06.01]

01.01.23
read, verb
obtain **data** from an input device, from a storage device, or from a **data** medium

01.01.24
read, noun
process of retrieving **data** from some **machine-readable medium** and, as appropriate, the contention and **error control** management, and channel and source decoding required to recover and communicate the **data** entered at source

01.01.25
write (2)
send **data** to an output device, to **data** a storage device, or to a **data** medium

01.01.26
encode, verb
convert **data** by the use of a code in such a manner that returning to the original form is possible

01.01.27
decode, verb
restore information from its coded representation to the original form

[IEC 60050-702 702-05-14]
[IEC 60050-702 702-09-44]

01.01.28
decoding
process of restoring information from its coded representation to the original form

01.01.29
incorrect read(1)
failure to **read** correctly all or part of the **data** set intended to be retrieved from a **transponder** during **read** or **interrogation** process

01.01.30
incorrect read(2)
condition that exists when the **data** retrieved by the reader/interrogator is different from the corresponding **data** within the machine-readable medium

[ISO/IEC 2382-9 09.06.09]

01.01.31
misread
condition that exists when the **data** retrieved by the reader/interrogator is different from the corresponding **data** within the transponder

cf. incorrect **read**

01.01.32
data coding
baseband **data** bit representation, or mapping of logical **data** bits to physical signals

01.01.33
data compaction
mechanism or **algorithm** to process the original **data** so that it is represented efficiently in a as few code words as possible

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01.01.34
data field
defined area of memory assigned to a particular item or items of **data**

01.01.35
message(1)
unit of **information** transmitted from a source to a destination

01.01.36
message(2)
in **information theory**; **communication theory**, an ordered sequence of characters intended to convey information

01.01.37
record
in the organization of **data**, a set of **data** elements treated as a unit

[ISO/IEC 2382-4:1999 04.07.03]

01.01.38
file
named set of records treated as a unit

[ISO/IEC 2382-4:1999 04.07.10]

NOTE Files are stored within a computer, portable **data** terminal or **information** management system.

01.01.39
tag
in hypermedia, a language element in a mark-up language used for structuring data text, or objects

Example start-tags and end-tags

01.01.40
semantics
means by which the purpose of a field of **data** is identified

EXAMPLE The semantic examples used in automatic **data** capture include ISO/IEC 15418/ANS MH10.8.2 **Data** Identifiers, GS1 Application Identifiers, X12/EDIFACT/CII EDI **Data** Element Qualifiers

01.01.41
syntax
way in which **data** is put together to form messages, including rules governing the use of appropriate identifiers, delimiters, separator character(s), and other non-**data** characters within the message

NOTE Syntax is the equivalent to grammar in spoken language.

EXAMPLE The syntactic example used in automatic **data** capture include ISO 15434/ANSI MH10.8.3 - Syntax for High Capacity ADC Media

01.01.42
binary coded decimal
BCD
binary-coded decimal representation
representation of decimal numbers in binary form using a group of four bits to represent an individual digit (0-9)

EXAMPLE In the binary-coded decimal notation that uses the weights 8-4-2-1, the decimal numeral 23 is represented by 0010 0011 as compared to its representation 10111 in the binary system.

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[ISO/IEC 2382-1:1993 01.02.08]

01.01.43
extended binary-coded decimal interchange code
EBCDIC
standard code that consists of 8-bit coded characters

NOTE Now largely replaced by ASCII.

01.01.44
automatic identification system
system for achieving accurate and unambiguous identification of a **data** bearing label, tag, transponder or a natural/prescribed feature, the **data** or feature being interrogated by means of a system appropriate source

01.01.45
machine-readable medium
characteristic of automatic **data** capture media that permits the direct transfer of **information** from a medium to a **data** processing system, without operator intervention

NOTE Linear bar code symbols and two-dimensional symbols, magnetic-stripe smart cards, contact memory buttons, radio frequency identification biometrics, and optical character recognition are technologies of machine reading. The **data** is usually contained in pre-defined locations (fields) within a **data** stream. This **data** can be interpreted by a computer program.

01.01.46
eye-readable character
cf. human-readable character
[ISO/IEC 2382-9 09.01.02]

01.01.47
human-readable information
text that appears with and is associated with a machine readable medium, and is intended to be conveyed to a person

NOTE 1 Human-readable information appears typically on a label (e.g. bar code, two-dimensional symbol, radio frequency tag).

NOTE 2 There are four types of human-readable information:

- human-readable interpretation,
- human translation,
- **data** area titles,
- free text and **data**.

01.01.48
human-readable interpretation
linear bar code or two-dimensional symbol information provided adjacent to a linear bar code, representing the encoded **data** within a symbol

01.01.49
human translation
human-readable information provided within proximity of the machine-readable medium, representing portions of the information encoded and **data** field descriptions not encoded in the symbols

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01.01.50
data area titles
data areas comprised of information in machine-readable or human-readable form.

NOTE Data areas are identified with the corresponding data area title in human-readable text that may be prefixed, if relevant, by the appropriate identifier.

01.01.51
free text
human-readable information other than what is encoded in the machine-readable medium

NOTE 1 This information may be needed by one or more users of the label.

NOTE 2 An example of free text is a product description.

01.01.52
human readable character
representation of a ***bar code***, ***data character*** ,or ***data check character*** in a standard eye-readable alphabet or numerals, as distinct from its machine-readable representation

01.01.53
electronic data interchange
EDI
exchange of **data** and documents between computer systems according to standard rules

01.01.54
item(1)
smallest identifiable entity within an application

01.01.55
item(2)
element of a set of **data**

NOTE Abridged term for **data** item.

EXAMPLE A **file** may consist of a number of items such as records, which, in turn, may consist of other items.

01.01.56
item(3)
single physical entity or a defined collection of entities having a distinct existence

01.01.57
unique item identifier
identification that uniquely identifies a specific entity (e.g. a product, transport unit, returnable asset) during its life within a particular domain and scope of a code system

NOTE 1 When used with this **data** protocol, the particular object identifier that defines the unique item identifier shall rely on the fact that each instance of its object shall be unique and unambiguous with all others related objects.

NOTE 2 As the object is unique, its use in the RF tag confers uniqueness to the RF tag itself.

01.01.58
license plate concept
concept where the fixed code contained in a **machine-readable medium** is used as a pointer into a **data**base

NOTE Similar to the way in which the police can determine your name, address, etc. from your car number plate.

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01.01.59
font
set of characters of a specific style and size of graphic type

NOTE 1 in text processing, a set of **characters** of the same size and style; for example, 9-point Helvetica

NOTE 2 also used analogously to refer to the set of **bar code symbol** characters for a **symbology** in on-demand printing equipment

01.01.60
algorithm
finite ordered set of well-defined rules for the solution of a problem

01.01.61
programmer
person who designs, **writes**, and tests programs

01.01.62
programming
designing, writing, modifying, and testing of programs

01.01.63
abstract, adj.
independent of something

EXAMPLE 1 An abstract syntax means that the structure of messages is specified independently from their encoding.

EXAMPLE 2 An abstract test suite is specified independently from the test tools on which it is executed.

01.01.64
impact
any influence upon a system, environmental or otherwise, that can influence its operational performance

01.01.65
tolerance
maximum permissible deviation of a system parameter value, caused by any system or environmental influence or **impact**

NOTE 1 Tolerance is usually expressed in parts per million (ppm).

NOTE 2 Tolerances are specified for a number of radio frequency parameters, including **carrier frequencies** sub-carriers, bit clocks and symbol clocks.

[ISO 15394, 4.2]

01.01.66
nominal
value at which a system is designed to assure optimal operation

01.01.67
data carrier
device or medium used to store **data** as a relay mechanism in an AIDC system, e.g. bar code, OCR character string, RF tag

01.01.68
leading zero
zero in a more significant digit place than the digit place of the most significant nonzero digit of a numeral

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01.01.69
leading zeros
zeros at the left of a number

01.01.70
distortion(1)
undesired change in the features of an image or waveform

01.01.71
distortion(2)
disturbance that causes an unwarranted change in the form or intelligibility of a signal

NOTE The distortion exhibits a noise like effect that can be quantified as the ratio of the magnitude of the distortion component to the magnitude of the undistorted signal, usually expressed as a percentage.

01.01.72
filler character
character inserted to extend an item of **data** to achieve a desired length

01.01.73
I.D. filter
software facility that compares a newly **read** identification (ID) with those within a **data**base or set, with a view to establishing a match

01.01.74
nominal range
range at which a system can assure reliable operation, considering the normal variability of the environment in which it is used

01.01.75
query(2)
request to extract **data** directly or to derive them from a **data**base, based on specified conditions; for example, a request to a reservation system for availability of a seat on a specific flight

01.01.76
readability
ability to retrieve **data** under specified conditions

01.01.77
resolution
smallest distance between indications of a measures attribute that can be meaningfully distinguished

NOTE The attribute may be amplitude, colour distance, etc

01.01.78
selection
in databases, an operation of relational algebra that forms a new relation which is a subset of the entity occurrences from a given relation

Example in a relation of "books " containing the attributes "author" and "title", the formation of a list of the titles of the books written by a particular author.

01.01.79
service
software program provides responses to requests from other software programs, which are frequently on other remotely connected computers

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01.01.80
software
in telecommunication, computer programs, procedures, rules and any associated documentation pertaining to the operation of equipment, a telecommunication network or other system

[IEC 60050-702 702-09-02]

01.01.81
time-slot
cyclic time interval that can be recognized and defined uniquely

NOTE In French, the expression “intervale de temps”, which is equivalent to the English term “time interval”, is deprecated when used to convey the concept of “time-slot”.

[IEC 60050-704 704-13-08]

01.01.82
timing information
in a synchronized network, information pertaining to the timing relationship of several series of events and which is conveyed by and\or derived from synchronization signals, timing signals, or time-scales embedded in digital signals

[IEC 60050-704 704-15-09]

01.01.83
verification(1)
comparing an activity, a process, or a product with the corresponding requirements or specifications

01.01.84
verification(2)
confirmation by examination and provisions of objective evidence that specified requirements have been fulfilled

01.01.85
verification(3)
act of reviewing, inspecting, testing, checking, auditing, or otherwise establishing and documenting whether or not items, processes, services or documents conform to specified requirements

01.01.86
zero-suppression(1)
elimination of non-significant zeros from a numeral

01.01.87
zero-suppression(2)
function that allows the process by which unwanted zeros are omitted from the printed or displayed result of a calculation

[ISO/IEC 2382-1:1993 01.05.05]

01.01.88
range
maximum distance at which a scanning device can **read** a symbol of given characteristics, equal to the sum of optical throw and depth of field

cf. reading distance

[cf. ISO/IEC 19762-4]

01.01.89
Accredited Standards Committee
ASC
committee that has been accredited under the procedures of the American National Standards Institute

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01.01.90
American National Standards Institute
ANSI
non-governmental organization responsible for the coordination of voluntary national (United States) standards

Contact: ANSI, 25 West 43rd Street, 4th floor, New York, NY 10036, Tel: 1.212.642.4900, Fax: 1.212.398.0023, http://www.ansi.org/

01.01.91
ANS
prefatory acronym to signify American National Standard

01.01.92
MH10
acronym assigned to the Accredited Standards Committee for the Material Handling Industry whose scope is to facilitate freight movement within transportation and distribution systems for transport-packages and unit-loads, including their dimensions, definitions, terminology, coding, labelling, and performance criteria; and to represent the United States interests within the scope of ISO/TC 122

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01.01.93
INCITS
International Committee for Information Technology Standards
the ANSI accredited standards developer responsible for the development of **information** technology standards within the United States

NOTE Formerly known as X3 and NCITS.

01.01.94
application identifier
AI
GS1 prefix that defines the meaning and purpose of the **data** element that follows, as defined in ISO 15418 GS1 Application Identifiers and ASC **Data** Identifiers and Maintenance and GS1 General Specifications

01.01.95
data identifier
DI
specified character or string of characters, that defines the intended use of the **data** element that follows

NOTE For the purposes of automatic **data** capture technologies, **Data** Identifier means the alphanumeric identifiers, as defined in ISO 15418, *GS1 Application Identifiers and ASC MH 10* ***Data*** *Identifiers and Maintenance* and ANS MH10.8.2.

01.02.01
parity
system for encoding ***characters*** as 'odd' (having an odd number of binary ones in their structure) or 'even' (having an even number of binary ones in their structure), used as ***self-checking*** mechanism in ***bar codes***

NOTE A parity bit (parity bar or module) can be incorporated into an encoded character to make the sum of all the bits always odd or always even, which acts as a fundamental check.

01.02.02
error correcting code
error detecting code which permits the automatic correction of some of the errors detected

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01.02.03
error detection code
redundant code in which the rules of construction permit the automatic detection of certain errors which have been produced during recording, processing or transfer of information, when these errors have caused a deviation from the rules

[IEC 60050-702 702-05-19]

01.02.04
packet(1)
block of **data** sent over a communication link

NOTE Each packet may contain sender, receiver, and error control information, in addition to the actual message. Packets can be fixed- or variable-length, and they are reassembled, if necessary, when they reach their destination.

01.02.05
packet(2)
in **data** communications, a sequence of bits arranged in a specific format, containing control **data** and possibly user **data**, and that is transmitted and switched as a whole

01.02.06
full-duplex transmission
data transmission in both directions at the same time in which the **data** is communicated while the transceiver transmits the activation field

Adapted from [ISO/IEC 2382-9:1995 09.03.07]

01.02.07
half-duplex transmission(1)
data transmission in either direction, one direction at a time

[ISO/IEC 2382-9:1995 09.03.07]

01.02.08
half-duplex transmission(2)
data transmission in either direction, one direction at a time in which the information is communicated after the **transceiver** has stopped transmitting the activation field

NOTE 1 Adapted from [ISO/IEC 2382-9:1995 09.03.06]

NOTE 2 Compare full duplex transmission.

01.02.09
protocol
set of rules that determines the behavior of functional units in achieving communication

01.02.10
query(1)
electronic request of information from one or more sources

01.02.11
data transfer rate
average number of bits, characters, or blocks transferred per unit time between two points

[ISO/IEC 2382-9 09.05.21]
NOTE 1 The rate at which **data** is communicated between **transponder** and the reader/interrogator.

NOTE 2 Typical units are bits per second or bytes per second.

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01.02.12
logical link control
LLC
higher component of the **Data** Link - Layer 2 in the OSI model that is primarily responsible for addressing and providing end-to-end error control and end-to-end flow control

01.02.13
logical link control protocol
LLC protocol
in a local area network, the protocol that governs the exchange of **frames** between **data** stations independently of how the transmission medium is shared

01.02.14
spectrum
in signal or noise, a set of sinusoidal oscillations representing in the frequency domain a time-varying signal or noise, each oscillation being characterized by its frequency, its amplitude, and its initial phase

01.02.15
memory partition
segmentation of an electronic **memory** to provide multiple levels of **information**

01.02.16
data transmission
transfer of **data** from one point to one or more other points over telecommunication facilities

01.02.17
synchronization
process of adjusting clock frequencies to achieve synchronism of two time-varying phenomena, time-scales or signals

Note The associated verb is “to synchronize”.

[IEC 60050-704 704-13-17]

01.02.18
scrambling
rearrangement or transposition of **data** to enhance security of stored **data** or the effectiveness of error control schemes

01.02.19
reading angle
in optically readable media, one of the three angles characterizing the angular rotation of a symbol in an axis relative to a scan line

01.02.20
reflectance factor
in AIDC techniques, the ratio of the radiant or luminous flux reflected by the sample in the directions delimited by the given cone to that reflected in the same directions by a perfect reflecting diffuser identically irradiated or illuminated

NOTE 1 adapted from [IEC 50 (845) 845-04-64]

NOTE 2 perfect reflecting diffuser – ideal isotropic diffuser with a reflectance equal to 1

NOTE 3 the radiant power reflected by a magnesium oxide or barium sulphate photometric standard is called reference reflected flux

NOTE 4 in AIDC techniques reflectance factor is sometimes called reflectance

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01.02.21
addressability(1)
(in computer graphics) number of addressable points on a device space or in storage

01.02.22
authentication
in security, the act of verifying the claimed identity of an entity

01.02.23
handshaking(1)
mechanism for the regulation of the flow of **data** between devices, achieved by both hardware and software methods

Example RTS/CTS and software techniques for example, Xon/Xoff

01.02.24
handshaking(2)
protocols and procedures used by two computers or a computer and a peripheral device for establishing communications

01.02.25
multiplexing
reversible process for assembling signals from several separate sources into a single composite signal for transmission over a common transmission channel: this process is equivalent to dividing the common channel into distinct channels for transmitting independent signals in the same direction

Note 1 Associated terms are “to multiplex”, ”multiplex”.

[IEC 60050-704 704-08-01]

Note 2 **Data** multiplexer: A functional unit for assembling signals from separate sources into a single composite signal.

[ISO/IEC 2382-9 09.04.06]

01.02.26
frame(1)
repetitive set of consecutive time-slots constituting a complete cycle of a signal or of another process in which the relative position of each time-slot in the cycle can be identified

[IEC 60050-704 704-14-01]

01.02.27
frame(2)
in **data** communications, a transmission frame is a **data** structure that consists of fields, predetermined by a protocol, for the user of **data** and control **data**

NOTE The composition of a frame, especially the number and types of fields may vary according to the type of protocol.

ISO/IEC 2382-9 09.06.08]

01.02.28
encryption(1)
means of securing **data** often applied to a plain or clear text, by converting it to a form that is unintelligible in the absence of an appropriate decryption key

01.02.29
encryption(2)
encipherrment
cryptographic transformation of **data**

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NOTE 1 The result of encryption is cipher text.

NOTE 2 The reverse process is called decryption.

01.02.30
error burst
group of **bits** in which two successive erroneous bits are always separated by less than a given number of correct bits

01.02.31
error control(1)
technique used to reduce the incidence of errors in the recording, processing or transfer of information

[IEC 60050-702 702-07-40]

01.02.32
error control(2)
in **data** communications, a part of a **protocol** that enables error **detection** and possibly error correction

01.02.33
check sum
CSUM
manipulation of the contents of a block of **data** to produce a code, which is attached to that block and can then be checked before and after transmission to determine whether the **data** has been corrupted or lost

NOTE Check sum is a packet level **error detection** method.

[ISO/IEC 2382-4 04.02.02]

01.02.34
data check character/digit
digit or ***character*** calculated from **data** and appended as part of the **data** string to ensure that the **data** is correctly composed and transmitted

NOTE compare symbol check character

01.02.35
BCC
block check character
parity **error** checking character added to **data** for the purposes of detecting transmission errors

01.02.36
block code
error detection code having a fixed length code format, wherein k **message** bits are accompanied by c parity bits to form an n-bit block code ($n = k + c$)

01.02.37
cyclic redundancy check(1)
CRC
packet level **error detection algorithm** which exploits the attributes of **modulo-2** arithmetic to generate, through the use of a generator polynomial, a transmission polynomial, comprising the **message** polynomial and a parity polynomial

01.02.38
cyclic redundancy check(2)
CRC
redundancy check in which the extra digits or characters are generated by a cyclic **algorithm**

[IEC 60050-702 702705-15]

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01.02.39
ECI designator
six-digit number identifying a specific ECI assignment

01.02.40
write protection
means to prevent writing or deletion of **data** on a **data** medium

Example Write-enable ring for a magnetic tape, write-protect notch on a diskette, an entry in the file access table to indicate that a file cannot be deleted.

01.02.41
BER
bit error rate
data error rate
ratio of the number of bits received in **error** to the total of bits transmitted, calculated by taking the number of erroneous bits divided by the total number of bits transmitted, received, or processed over some stipulated period of time

NOTE Adapted from ISO/IEC 2382-9 09.06.20.

01.02.42
conformity
fulfilment by a product, process or service of specified requirements

[ISO/IEC Guide 2:1996 12.1]

01.02.43
validation
confirmation by examination and provisions of objective evidence that the particular requirements for a specific intended use are fulfilled; that all requirements have been implemented correctly and completely and are traceable to system requirements

01.02.44
real time
level of responsiveness that a user senses as sufficiently immediate or that enables a device to keep up with some external process

01.02.45
redundancy
in a functional unit, the existence of a means for improving reliability in addition to the essential set of means for performing a required function

01.02.46
environmental parameter
external parameter that can have a bearing or **impact** upon system performance

NOTE Temperature, pressure, humidity and noise are examples of environmental parameters.

01.02.47
error(1)
in **digital data, the** result of capture, storage, processing or communication of **data** in which a bit or bits assume the wrong values, or bits are missing from a **data** stream

01.02.48
error(2)
discrepancy between a computed, observed, or measured value and condition and the true, specified, or theoretically correct value or condition

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01.02.49
error(3)
invalid condition experienced by a system

NOTE An attempt to divide by zero is an example of an error.

01.02.50
penetration
unauthorized access to a **data** processing system

01.02.51
implementation conformance statement
ICS
statement made by the supplier of an implementation or system claimed to conform to a given specification, providing detailed information on which capabilities have been implemented, and stating whether the product or service is conformant or not

NOTE The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, and information object ICS.

01.03.01
application standard
specification defining the method by which and conditions under which bar code technology may be applied to a particular purpose, prescribing, for example, **data** formats, optical requirements and symbology related parameters as subsets of the **range** defined by relevant technical standards

01.03.02
vector(1)
quantitative component that exhibits magnitude, direction, sense, and origin

01.03.03
vector(2)
directed line segment quantity usually characterized by an ordered set of scalars

01.03.04
Manchester coding
bi-phase **code** format in which each bit in the source **encoded** form is represented by two bits in the derived or channel **encoded** form

NOTE The transformation rule ascribes 01 to represent 0 and 10 to represent 1

01.03.05
Manchester encoding
binary phase encoding in which the time interval assigned to each bit is divided in half by a transition whose direction determines the value of the bit

NOTE 1 The transition may occur between two states of a physical variable such as voltage, magnetic polarity, or light intensity.

NOTE 2 If the physical variable is electrical, this type of encoding is polarity-dependent but is free of a DC component.

[ISO/IEC 2382-9 09.05.03]

[ISO/IEC 2382-16 16.02.01]

01.03.06
Miller coding
format for encoding digital **data**. A logical “1” has a transition in the middle of the bit period., where a logical “0” has a no transition, unless followed by another zero

NOTE In this case, the second zero bit period starts with a bit transition.

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01.03.07
differential encoding(1)
cf. NRZ-Space.

01.03.08
differential encoding(2)
encoding of a digital **data** stream in which each element except the first is represented as the difference in value between that element and the previous element

01.03.09
non-return to zero (mark) recording
NRZ-M
synonym for non-return-to-zero change-on-ones recording

01.03.10
non-return to zero code
NRZ
generic format for coding of digital **data** in which the state is constant throughout the bit period

NOTE 1 A communication code in which a binary one is represented by one bit time at the 1 level and a binary 0 is represented by one bit time at the 0 level. This permits storing about twice as much **data** as can be stored with a return-to-zero code.

NOTE 2 There are three forms: NRZ-Level, NRZ-Mark (NRZ-I) and NRZ-Space

01.03.11
non-return to zero recording
NRZ
recording when there is no return-to-zero balance between pulses

01.03.12
non-return to zero-Invert on ones
NRZ-I or NRZ-M
format for encoding digital **data** that uses a transition (voltage change) at the beginning of a bit period to denote a logical "1" and no transition at the beginning of a bit period to denote a logical "0"

01.03.13
non-return to zero-level
NRZ-L
format for encoding digital **data** that uses a transition (voltage change) to a “high level” to represent a logic "1" in the **data** and a transition to a “low level” to represent a logic "0" is represented as a transition to a "low" level

01.03.14
non-return to zero-space
NRZ-Space
format for encoding digital **data** that uses a transition (voltage change) at the beginning of a bit period to denote a logical "0" and no transition at the beginning of a bit period to denote a logical "1"

NOTE NRZ-Space is often called “differential” encoding

01.03.15
return to zero
RZ
format for encoding **data** that uses a low to high signal transition at the beginning of a logic "1" and a high to low signal transition in the middle of the bit

NOTE The logic "0" has no signal transition.

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cf. "NOR-I" and "NOR-L"

01.03.16
concatenation
facility to link together specific **items** of **data** held in **data** carriers, to form a single **file** or field of **data**

01.03.17
addressability(2)
(in micrographics) number of addressable horizontal points by the number of addressable vertical points within a specified film frame

EXAMPLE An addressability of 4000 by 4000.

01.03.18
symbol
graphic representation of a concept that has meaning in a specific context

[ISO/IEC 2382-1 01.02.07]

01.03.19
symbology identifier
sequence of characters generated by the decoder and prefixed to the **decoded data** transmitted by the decoder, that identifies the symbology from which the **data** has been decoded

01.04.01
concentrator(1)
means of connecting a number of **data** communication devices and concentrating **packets** of **data** at a local point before onward transmission on a single link to a central **data** processor or information management system. In contrast to **multiplexors** concentrators usually have a buffering capability to 'queue' inputs that would otherwise exceed transmission capacity

01.04.02
concentrator(2)
in **data** communications, a device used to divide a **data channel** into two or more channels of lower average speed, dynamically allocating channel space according to demand in order to maximize throughput

cf. statistical multiplexor.

01.04.03
controller

cf. multiplexer

01.04.04
conventional printing process
printing process typically using a printing plate (or cylinder) and wet ink to produce multiple impressions of an image on a substrate

NOTE Lithography, letterpress, flexography, photogravure, screen process, and hot foil stamping are examples of conventional printing processes.

01.04.05
current loop
teletype (TTY) communications **interface** that allows **data** to be transmitted over relatively long distances and in noisy environments

NOTE Point to point connection only.

01.04.06
decoder
device for restoring information from a coded representation form according to a given code

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01.04.07
EEPROM
electrically erasable programmable **read** only memory

01.04.08
host(1)
electronic computing device, such as a personal computer, which provides an interface between the user and the non-contact information system

NOTE The host is the Master in a master-slave relationship between the host, through the **Interrogator,** and the **tags** in the Field-of-View of the Interrogator

01.04.09
host(2)
synonym for host computer

01.04.10
interface
shared boundary between two functional units, defined by various characteristics pertaining to the functions, physical interconnections, signal exchanges, and other characteristics, as appropriate

[ISO/IEC 2382-1:1993 01.01.35]

NOTE Examples of interfaces are RS232, RS422, RS485, and air interface

01.04.11
light emitting diode
LED
semiconductor that produces light at a wavelength determined by its chemical composition as a result of electrical stimulation

NOTE A range of devices is available, each having an output with a peak wavelength in the spectrum between 600 nm (visible red) and 900 nm (infrared). It is commonly used as a light source in ***wand***, ***CCD*** and slot-type bar code ***readers***

01.04.12
memory
all of the addressable storage space in a processing unit and all other internal storage that is used to execute instructions

NOTE 1 In a memory, **data** are stored in electronic form.

NOTE 2 A variety of random access (RAM), **read**-only (ROM), **Write Once/Read Many** (WORM) and **read/write** (RW) memory devices can be distinguished.

[ISO/IEC 2382-1:1993]

01.04.13
node(1)
any device attached to a network capable of communicating with other network devices

01.04.14
node(2)
in a network, an entity that is associated with or connected to one or more other entities

NOTE In network topology or in an abstract arrangement, the nodes are points on a scheme. In a computer network, the nodes are computers or **data** communication equipment. A network may contain end nodes and intermediate nodes

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01.04.15
node(3)
in a **data** structure, a point from which subordinate items originate

NOTE A node may have no subordinate items and is then called a terminal node. In a **data** network, a point where one or more functional units interconnect transmission **channels** or **data** circuits.

01.04.16
multiplexer (in **data** communications)
equipment for effecting multiplexing

[IEC 60050-704 704-08-13]

01.04.17
output device
(integrated artwork) final piece of computer-driven equipment used to produce artwork

NOTE The output device is typically an image setter or cylinder engraver.

01.04.18
reader(1)
functional unit that is used for the acquisition or interpretation of **data** from a storage device, from a **data** medium, or from another source

01.04.19
reader(2)
in micrographics, a device that enlarges micro images for viewing

01.04.20
visible laser diode
VLD
laser diode operating in the visible light spectrum

01.04.21
laser(1)
(light amplification by the stimulated emission of radiation)
device for producing an intense beam of monochromatic coherent light

01.04.22
laser(2)
source emitting coherent optical radiation produced by simulated emission

[IEC 50 (845) 845-04-39]

01.04.23
RS232
common physical **interface** standard, specified by the EIA for the interconnection of devices, that allows a single device to be connected (point-to-point) at baud rates up to 9600 bps and distances up to 15 m

NOTE More recent implementations of the standard may allow higher baud rates and greater distances.

01.04.24
RS422
balanced **interface** standard similar to **RS232** but more noise immune and using differential voltages across twisted pair cables, that can be used to connect single or multiple devices to a master unit, at distances up to 3000 m

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01.04.25
RS485
enhanced version of **RS422** which permits multiple devices (commonly 32) to be attached to a two-wire bus at distances greater than 1000 m

01.04.26
expansion port
plug accessing additional I/0 capabilities on a computer or peripheral device

01.04.27
port concentrator
device that accepts the outputs from a number of **data** communication interfaces for onward transmission into a communications network

cf. concentrator, multiplexer
[ISO/ICE 2382-1 01.05.03]
[ISO/IEC 2382-9 09.06.04]

01.04.28
type approval
approval based on type testing

[ISO/IEC GUIDE 2:1996 16.1.1]

01.04.29
mean time between failures
MTBF
number of hours that pass before a component, assembly, or system fails

NOTE 1 Adapted from IEC 60050-191 191-12-08

NOTE 2 MTBF is a basic measure of reliability for repairable items and is a commonly used variable in reliability and maintainability analyses.

01.04.30
mean time to repair(1)
MTTR
average period of time experienced by a population of devices to repair a device that has failed

01.04.31
mean time to repair(2)
MTTR
for a given functional unit, under stated conditions, the average duration required for corrective maintenance

01.04.32
interoperability testing
testing which checks that two or more products, pieces of equipment, or services, are able to perform together a set of functions defined in specifications or standards

NOTE 1 The communication **interface protocols** between the products may be also covered by the specifications/standards.

NOTE 2 Interoperability testing is a generic term, and a further refinement of its definition is necessary to distinguish between end-to-end testing, compatibility testing, and mapping testing.

01.04.33
corporate LAN
customer-provided network such as Ethernet or wireless LAN

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01.05.01
unit load
one or more transport packages or other items held together by means such as pallet, slip sheet, strapping, interlocking, glue, shrink wrap, or net wrap, making them suitable for transport, stacking, and storage as a unit

01.05.02
unitized
secured together so as to be handled as an entity

01.05.03
returnable transport item
RTI
all means to assemble goods for transportation, storage, handling and product protection in the supply chain which are returned for further usage, including for example pallets with and without cash deposits as well as all forms of reusable crates, trays, boxes, roll pallets, barrels, trolleys, pallet collars and lids

NOTE 1 The term returnable transport item is usually allocated to secondary and tertiary packaging. But in certain circumstances also primary packaging may be considered as a form of RTI

NOTE 2 Freight containers, trailers and the term returnable transport item does not cover other similar enclosed modules

NOTE 3 Returnable transport equipment is considered to have the same definition within an electronic **data** interchange environment.

01.05.04
transport package
package intended for the transportation and handling of one or more articles, smaller packages, or bulk material

[ISO 15394, 4.2]

01.05.05
transport unit
either a transport package or a unit load

01.05.06
freight containers
article of transport equipment having

a) a permanent character and accordingly strong enough to be suitable for repeated use;

b) specially designed to facilitate the carriage of goods by one or more modes of transport, without intermediate reloading;

c) fitted with devices permitting its ready handling, particularly its transfer from one mode of transport to another;

d) so designed as to be easy to fill and empty;

e) having an internal volume of 1 m3 (35.3 ft3) or more.

[ISO 830, 3.1]

NOTE Returnable transport equipment is considered to have the same definition within an electronic **data** interchange environment.

01.05.07
product
first level or higher assembly that is sold in a complete end-usable configuration

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[EIA 802, 3.16]

01.05.08
product packaging
first tie, wrap or container to a single item or quantity thereof that constitutes a complete identifiable pack.

NOTE A product package may be an item packaged singularly, multiple quantities of the same item packaged together or a group of parts packaged together.

[ISO 22742, 3.32]

01.05.09
conveyable
item that can be moved efficiently and safely on handling devices used to move material over a fixed line of travel

NOTE Such material handling devices, or conveyors, are for the purposes of this standard considered to be continuous-loop belted systems moving packages or objects in a predetermined path and having fixed or selective points of loading or discharge. The width of the belt, height permitted within the facility, and weight capacity of the belt may determine whether the items are conveyable

01.05.10
non-conveyable
item of such width, height, or weight to preclude its movement on conveyor systems

01.05.11
manifest
listing of **information items** about a shipment

NOTE A manifest can include items such as transportation, shipper, and contents.

01.05.12
item management
controlled process for the manufacturing, storage, distribution and transport of items through all stages from creation to final consumption or disposal

NOTE The item management processes can involve a change of state or configuration, a change of location, or controlled or observed change over time

01.05.13
use case
detailed description of a single activity in a business process that identifies **data** inputs and outputs, performance/timing requirements, the handling of error conditions and interfaces with external applications

[ISO 15394, 4.2]

01.05.14
open application environment
application in which independent parties may freely participate and in which bilateral arrangements are not necessary

cf. closed application environment

01.05.15
open system
system containing publicly defined **interfaces** and **protocols** to facilitate **interoperability** with other systems, perhaps of different design or manufacture

cf. closed system, open application environment

01.05.16
closed application environment
closed application environment system
application which is intended for use by a closed group of users

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cf. open application environment

NOTE A closed group of users is typically within a single organization or subject to a specific agreement.

01.05.17
closed system(1)
system whose characteristics comply with proprietary standards

cf. open system

01.05.18
closed system(2)
system in which **data** handling, including capture, storage and communication, are under the control of the organization to which the system belongs

cf. open system

01.05.19
class
defined application of unique identifiers for item, transport unit, returnable transport unit, etc. recognised as classes by all parts of ISO/IEC 15459

01.05.20
class of items
number of items regarded as forming a group by reason of common attributes, characteristics or qualities

01.05.21
class of unique identifiers
number of unique identifiers used to identify items within a class of items

01.05.22
sortation
process by which an automated material-handling system routes packages and freight in a distribution environment

04.02.01
extended channel interpretation
ECI
protocol used by some symbologies that allows the output data stream to have interpretations other than that of the default ***character set***

04.02.02
extended channel model
decoder operating within a system for encoding and transmitting both data message bytes and control information about the message operates in extended channel mode

NOTE The control information is communicated using ***Extended Channel Interpretation (ECI)*** escape sequences.

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Information technology – AIDC techniques – Harmonized vocabulary, Abbreviations

AI		Application Identifier
ANS		American National Standard
ANSI		American National Standards Institute
ASC		Accredited Standards Committee
BCC		block check character
BCD		binary coded decimal
BER		basic encoding rate
CRC		cyclic redundancy check
CSMA/CD		carrier sense multiple access with collision detection network
CSUM		check sum
DI		Data Identifier
ECI ?		fill in the blank
EDI		electronic data interchange
EEPROM		electrically erasable programmable read only memory
HEX		hexadecimal
INCITS		International Committee for Information Technology Standards
LAN		Local Area Network
LASER		light amplification by the stimulated emission of radiation
LED		light emitting diode
LLC		Logical Link Conrol
LSB		Least Significant Bit
MH10		Accredited Standards Committee for the Material Handling Industry
MSB		Most significant bit
MTBF		Mean time between failure
MTTR		mean time to repair
NRZ		non-return zero
NRZ Space		non-return zero space
NRZ-I		non-return to zero-Invert on ones
NRZ-M		non-return to zero-Invert on ones
RTI		returnable transport item

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RZ		return zero
VLD		visible laser diode

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Information technology – AIDC techniques – Harmonized vocabulary, Index

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Accredited Standards Committee		01.01.89
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Information technology AIDC techniques - Harmonized vocabulary, Part 2 - Optically Readable Media (ORM)

Techniques automatiques de la saisie d'identification et de données (AIDC)— Vocabulaire harmonisé — Partie 2: Medias Optiquement Lisibles (ORM)

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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.

ISO/IEC 19762 was prepared by ISO/IEC JTC 1/SC 31 – Automatic Identification and Data Capture Techniques, Vocabulary Rapporteur.

ISO/IEC 19762 consists of the following parts, under the general title *Information technology - AIDC techniques - Harmonized vocabulary*:

Part 1: Information technology, AIDC techniques - Harmonized vocabulary - General terms relating to Automatic Identification and Data Capture (AIDC)

Part 2: Information technology, AIDC techniques - Harmonized vocabulary - Optically Readable Media (ORM)

Part 3: Information technology, AIDC techniques - Harmonized vocabulary - Radio-Frequency Identification (RFID)

Part 4: Information technology, AIDC techniques - Harmonized vocabulary – General terms relating to radio communications

Part 5: Information technology, AIDC techniques - Harmonized vocabulary – Locating systems

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Introduction

ISO/IEC 19762 is intended to facilitate international communication in information technology, specifically in the area of automatic identification and data capture (AIDC) techniques. It provides a listing of terms and definitions used across multiple AIDC techniques.

Abbreviations used within each part of ISO/IEC 19762 and an index of all definitions used within each part of ISO/IEC 19762 is found following the end of each document.

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Information technology AIDC techniques – Harmonized vocabulary, Part 2 - Optically Readable Media (ORM)

Scope

This part of ISO/IEC 19762 provides general terms and definitions in the area of automatic identification and data capture techniques on which are based further specialized sections in various technical fields, as well as the essential terms which should be used by non-specialist users in communication with specialists in automatic identification and data capture techniques.

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 19762-1, *Information technology AIDC techniques - Harmonized vocabulary, Part 1 - General terms relating to Automatic Identification and Data Capture (AIDC)*

ISO/IEC 19762-3, *Information technology AIDC techniques - Harmonized vocabulary, Part 3 - Radio-Frequency Identification (RFID)*

ISO/IEC 19762-4, *Information technology AIDC techniques - Harmonized vocabulary, Part 4 – General terms relating to Radio Communications*

ISO/IEC 19762-5, *Information technology AIDC techniques - Harmonized vocabulary, Part 5 – Locating systems*

ISO/IEC 2382-4, *Information technology -- Vocabulary -- Part 4: Organization of data*

ISO/IEC 2382-12, *Information processing systems -- Vocabulary -- Part 12: Peripheral equipment*

IEC 60050-845, *International Electrotechnical Vocabulary. Lighting*

Classification of entries

The numbering system employed within ISO 19762 is in the format nn.nn.nnn, in which the first two numbers (***nn***.nn.nnn) represent the “Top Level” reflecting whether the term is related to 01 = Common to All AIDC Techniques, 02 = Common to All Optically Readable Media, 03 = Linear Bar Code Symbols, 04 = Two-dimensional Symbols, 05 = General terms radio, 06 = Radio Frequency Identification, 07 = Real Time Locating Systems, and 08 = MIIM. The second two numbers (nn.***nn***.nnn) represent the “Mid Level” reflecting whether the term is related to 01 = Basic Concepts/Data, 02 = Technical Features, 03 = Symbology, 04 = Hardware, and 05 = Applications. The third two or three numbers (nn.nn.***nnn***) represent the “Fine” reflecting a sequence of terms.

The numbering in this part of ISO/IEC 19762 employs “Top Level” numbers (**nn**.nn.nnn) of 02, 03, and 04.

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Terms and definitions

02.01.01
optically readable medium
ORM
member of the set of automatic identification techniques such as a linear bar code, two-dimensional, mark sense, or optical character recognition (OCR) symbols, that are illuminated by a light source and examined by an optical detector that converts the received reflectance into an electrical signal that are grouped in a predetermined method, recognized by the reader and converted into the corresponding computer code

02.01.02
symbology
standard means of representing data in ***optically machine readable*** form

NOTE each symbology specification sets out its particular rules of composition or symbol ***architecture***

02.01.03
bar code symbol
combination of symbol ***characters*** and features required by a particular **symbology** which together form a complete scannable entity

02.01.04
symbol architecture
structure of a ***bar code symbol***

NOTE see symbology

02.01.05
bar
dark ***element*** corresponding to a region of a ***scan reflectance profile*** below the global threshold

02.01.06
quiet zone
area free from interfering markings which must surround a ***bar code symbol*** and, in particular, precede the ***start character*** and follow the ***stop character***

02.01.07
symbol character
physical representation of the codeword as a pattern of ***dark and light elements***

NOTE There may be no direct one-to-one mapping between symbol character and ***data character*** or auxiliary character. Decoding through the compaction rules is necessary to identify the ***data.***

02.01.08
coded character set
in AIDC techniques, set of single *characters* that is mapped onto their byte values according to a linear bar code or *two dimensional symbology*

02.01.09
bar code character
see *symbol character*

02.01.10
X dimension
specified width of the narrow ***elements*** in a bar code ***symbol*** or the specified width of a single element in a two dimensional ***symbol***

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cf. Z Dimension

02.01.11
Y dimension
specified height of the ***elements*** in a linear bar code ***symbol*** or a ***row*** in a multi-row ***symbology***

cf. Bar Height

02.01.12
Z dimension
average achieved width of the narrow elements in a ***bar code symbol***, equal to half the sum of the average narrow bar width and the average narrow space width, in two-width symbologies, or to the quotient of the average overall ***character*** width divided by the number of ***modules*** per character in modular symbologies

02.01.13
module(1)
in a linear or multi-row bar code symbology, the nominal unit of measure in a ***symbol character***

NOTE In certain symbologies, ***element*** widths may be specified as multiples of one module. Equivalent to ***X Dimension***

02.01.14
element (symbol character or symbol)
single ***bar*** or space in a bar code ***symbol*** or a polygonal or circular single cell in a matrix symbol, which according to symbology rules form a symbol ***character***

NOTE The width of individual elements may be expressed in ***modules***, or in multiples of the ***X dimension***

02.01.15
resolution
width of the narrowest ***element*** capable of being read by the scanner equipment under test conditions

02.01.16
bar height
dimension of an individual ***bar*** in a linear bar code symbol or in a row of a multi-row bar code symbol measured perpendicular to the scanning direction

cf. Y dimension

02.01.17
bar width
transverse dimension of an individual ***bar*** in a linear bar code ***symbol*** or two-dimensional ***symbol*** measured parallel to the scanning direction

NOTE The number of possible width variations within a particular printed ***symbol*** depends on the ***symbology*** used.

02.01.18
symbol width
The total width of a ***bar code symbol*** including the ***quiet zones***

NOTE Also referred to as symbol length

02.01.19
symbol aspect ratio
ratio of the ***symbol*** height to the ***symbol width***

02.01.20
bar-space sequence
sequence which represents the ***module*** widths of the ***elements*** of a symbol ***character***

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02.01.21
self-checking
property of a ***symbology*** whereby a checking algorithm is applied to each ***character*** in the code

NOTE ***Substitution errors*** can then only occur if two or more separate printing ***defects*** occur within one character. Codes, which are not self-checking usually, have a check character added to the encoded data. Check characters can be added to self-checking symbols to further enhance data integrity.

02.01.22
orientation pattern
unique spatial arrangement of dark and light ***modules*** in a ***symbology*** used to detect the spatial orientation of the ***symbol***

02.01.23
shift character
symbology character which is used to switch from one ***code set*** to another for a single ***character***, or in the case of "double shift" or "triple shift" characters, for two or three characters respectively, following which data encodation reverts automatically to the code set from which the shift was invoked

02.01.24
latch character
symbology character which is used to switch from one ***code set*** to another

NOTE The code set stays in effect until another latch or shift ***character*** is explicitly brought into use or until the end of the ***symbol*** is reached.

02.02.01
decode algorithm
set of rules used, in a ***bar code*** or ***matrix symbology,*** to convert the ***element pattern*** of a symbol to data ***characters***

02.02.02
print quality
degree to which a printed optical ***symbol*** complies with the requirements which are specified for it, such as dimensions, ***reflectance,*** edge roughness, ***spots***, ***voids***, etc., which will affect the performance of the scanner

02.02.03
verification
verification by which a ***symbol*** is measured to determine its conformance with the specification for that symbol

02.02.04
verifier
device used for verification of a symbol

NOTE verifier used to measure and analyze quality attributes of a symbol such as symbol element width and ***quiet zone*** dimensions, ***reflectance***, and other aspects against a standard to which the linear ***bar code*** and two-dimensional ***symbols*** should conform

02.02.05
background
light area between and surrounding the dark ***elements*** of a printed ***symbol.*** The background can be the ***substrate*** on which the symbol is printed or an ***over-printing*** of a suitable light color.

02.02.06
substrate
material or medium upon which printed matter such as a *bar code symbol* , *OCR characters* or a coating is imposed

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02.02.07
reflectance
in incident radiation of given spectral composition, polarization and geometrical distribution, the ratio of the reflected radiant or luminous flux to the incident flux in the given conditions

[IEC 50 (845) 845-04-58]

NOTE 1 reflectance (sometimes in AIDC techniques called reflectance factor) is measured on a scale of 0 to 1, at a wavelength or bandwidth of light (spectral response) specified in the particular application specification

NOTE 2 barium sulphate or magnesium oxide are used as 'near perfect' reference white standards (a perfect standard of pure white would have a reflectance of 1.00 at any wavelength of light). The absence of any light in a vacuum is used as reference black standard

NOTE 3 samples (such as substrates, inks, etc.) are tested against the standards under similar illumination

02.02.08
regular reflection
reflection in accordance with the laws of geometrical optics, without diffusion

[IEC 50 (845) 845-04-45]

NOTE also known as specular reflection

02.02.09
diffuse reflection
diffusion by reflection in which, on the macroscopic scale, there is no regular reflection

[IEC 50 (845) 845-04-47]

02.02.10
spectral response
sensitivity of a scanner or other device to light of different wavelengths

02.02.11
reflectance difference
difference between the ***reflectance*** of ***light and dark elements*** of a bar code ***symbol***

02.02.12
show through
property of a ***substrate*** that allows underlying markings or materials to affect the ***reflectance*** of the substrate

NOTE compare ***opacity***

02.02.13
gloss
propensity of a surface to reflect a proportion of incident light in a specular manner

02.02.14
transmittance(1)
(for incident radiation of given spectral composition, polarization and geometrical distribution)
(τ) ratio of the transmitted radiant or luminous flux to the incident flux in the given conditions

Unit: 1

[IEC 50 (845) 845-04-59]

02.02.15
transmittance(2)
(optical) density [$D\tau$]
algorithm to base ten of the reciprocal of the transmittance

$D_\tau = - \log_{10} \tau$

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[IEC 50 (845) 845-04-66]

NOTE τ - transmittance.

02.02.16
opacity
property of a substance of preventing light from passing through it

NOTE ***Substrate*** opacity affects show-through from the reverse side of the substrate or any substance underneath it. Ink opacity determines the ***show through*** from the substrate.

02.02.17
scan reflectance profile
plot of the variations in ***reflectance*** with distance along a scan path through a ***symbol*** representing the analogue waveform produced by a device scanning the symbol

02.02.18
densitometer
photometer for measuring reflectance or transmittance optical density

[IEC 50 (845) 845-05-27]

NOTE 1 an instrument that measures the degree to which light is transmitted through or reflected from a material.

NOTE 2 a calibrated ***photometer*** compares the transmitted or reflective light with the incident light, and the result may be displayed as percentage ***reflectance*** or ***density***

02.02.19
photometer
instrument for measuring photometric quantities

[IEC 50 (845) 845-05-15]

NOTE in AIDC techniques photometer is used to measure the luminous intensity of light at specified wavelengths

02.02.20
Print Contrast Signal
PCS
measure of the relative difference between the reflectance of light and dark elements (in the following formula, RL and RD respectively):

PCS= (RL-RD)/RL.

NOTE compare reflectance difference

02.02.21
printability test
test of print quality

02.02.22
defect
lack of, or deficiency in, a characteristic essential in satisfying applicable requirements, that may affect the ability of a functional unit to perform a required function

NOTE Area of unwanted image usually referred to as ***spots*** or ***voids.***

02.02.23
void
area of high ***reflectance*** in an area of a ***bar code symbol*** which is intended to be of low reflectance

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NOTE compare speck, spot.

02.02.24
speck
cf. spot

02.02.25
spot
ink or dirt mark or other area of low ***reflectance*** in an area of a ***symbol*** which is intended to be of high reflectance

cf. void

02.02.26
reference decode algorithm
decode ***algorithm*** quoted in a ***symbology*** specification as the basis for the ***reference thresholds decodability*** values

02.02.27
reference threshold
boundary point used by a ***reference decode algorithm*** to make a decision as to the measurement of an ***element*** or combination of elements

02.02.28
decodability
measurement of relations from combinations of ***bars*** and spaces together or alone according the reference decode ***algorithm***. The value gives a measurement of how good a bar code ***symbol*** can be ***decoded***

02.04.01
scan(1), noun
single pass of a scanning beam over a symbol or a portion of a symbol

02.04.02
scan(1), verb
systematically examine **data**

02.04.03
scan(2), noun
single image capture with an image capture device

02.04.04
scanner
optical scanner that converts optical information (e.g., a printed ***bar code*** or two dimensional symbols) into electrical signals for subsequent decoding and transmission to a computer

02.04.05
bar code reader
device used to capture the data encoded in a ***bar code symbol***, consisting of two parts:

1) the scanner an input device which sends signals proportional to the reflectivity of each successive **element** of the ***symbol*** to the ***decoder***, and

2) the decoder, which examines the signals from the scanner and translates them into recognizable or computer-compatible data. The decoder itself is sometimes erroneously called a reader

02.04.06
read rate
percentage representing the number of good ***reads*** per 100 attempts to read a particular ***symbol***

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02.04.07
contact scanner
particular type of scanner in which the scanning action takes place with the scanner in actual or near contact with the ***symbol*** e.g. ***wand*** or light pen.

02.04.08
wand
pen-shaped object that includes a graphics tablet's stylus but most commonly refers to the scanning mechanism used with many bar code ***readers***

02.04.09
aperture
effective opening in an optical system that establishes the field of view

02.04.10
effective aperture
apparent field of view of a scanner or similar device determined by the smaller of the spot size and the physical aperture of the scanner for reception of reflected light

02.04.11
single line (beam) scanner
scanner in which the light beam traverses a single path, giving a one-dimensional field of view

02.04.12
slot reader
bar code reading device, which requires that the bar-code material is drawn through a slot into which a near-contact bar code reader is built

NOTE the device requires that the ***bar code symbol*** be in a fixed location relative to the edge of a thin ***substrate***

02.04.13
charge-coupled device
CCD
electronic light-sensitive component used in a linear or two-dimensional array as the light-collecting ***element*** in certain types of bar code ***reader***

02.04.14
helium neon laser
type of ***laser*** commonly used in ***bar code*** scanners that emits visible coherent red light at a wavelength of 632,8nm

02.04.15
moving beam scanner
scanning device in which the scanning beam is swept by mechanical or electronic means

02.04.16
fixed beam scanner
scanning device in which the beam of light is emitted in a fixed direction, relying on movement of the ***bar code symbol*** relative to the beam to achieve the scanning action

02.04.17
raster scanner
moving beam scanner which emits several parallel scanning beams

02.04.18
raster
projection of a ***laser*** beam to create multiple, nearly parallel, scan lines instead of a single line

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cf. bar code reader, decoder.

02.04.19
oscillating mirror scanner
single beam scanner with an additional mirror oscillating in a plane at right angles to the scanner beam and causing (for example) a horizontal field of view to be swept up and down vertically

02.04.20
omnidirectional scanner
scanner, such as a ***flat bed scanner***, capable of reading ***symbols*** whatever their orientation in a plane parallel or near parallel to the exit window of the scanner

02.04.21
flat-bed scanner
omnidirectional scanner in which the scanning beam(s) are directed upwards through a window or slot(s) and over which the ***bar code symbol*** is passed

02.04.22
reading angle
(optically readable media)
one of the three angles characterizing the angular rotation of a symbol in an axis relative to a scan line

NOTE reading angles are called tilt, skew and pitch

02.04.23
orientation
machine-readable medium alignment with respect to the **reader** expressed in three-dimensional angular terms, with **range** of variation expressed in terms of skew, pitch and roll (tilt)

02.04.24
tilt
reading angle, characterising the rotation of a bar code symbol about an axis perpendicular to the substrate

NOTE compare ***pitch, skew***

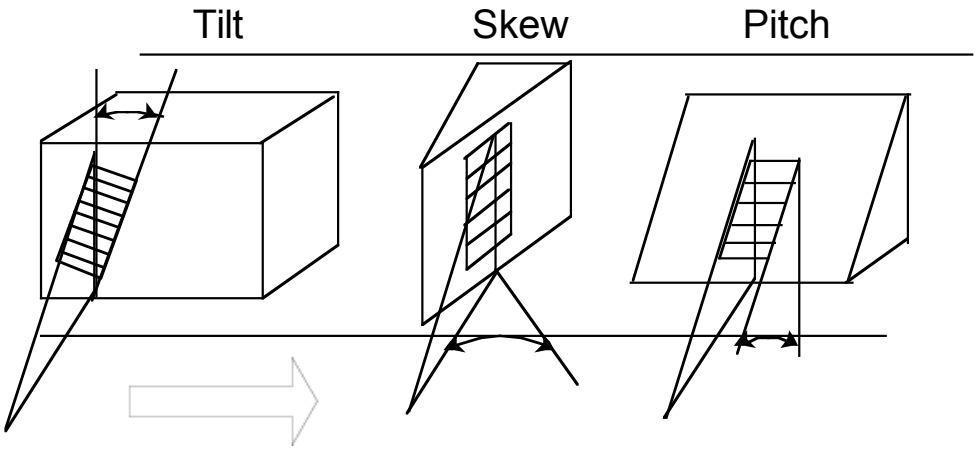


Figure 1 – tilt, skew, and pitch

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02.04.25
skew
in optically readable media, the reading angle characterising the rotation of a bar code ***symbol*** about an axis parallel to the symbol ***width***

NOTE compare pitch, tilt

02.04.26
pitch (optically readable media)
reading angle characterising the rotation of a bar code ***symbol*** about an axis parallel to the height of the ***bars***

NOTE compare skew, tilt

02.04.27
optical throw
distance from the face of a scanning device to the beginning of the ***depth of field***, for a ***symbol*** of given characteristics

Compare ***depth of field***, ***range***, and ***reading distance***

02.04.28
scanning window
entire area in front of the exit window of a non-contact scanner in which ***symbols*** can be read

NOTE also known as effective reading zone

02.04.29
reading distance
distance (or range of distances) from the exit window of a scanner at which the scanner can reliably ***read*** a ***symbol***

NOTE The minimum reading distance is equal to the ***optical throw*** and the maximum reading distance is equal to the ***range*** of the scanner

cf. depth of field, optical throw range

02.04.30
depth of field(1)
range between the minimum and maximum distances from the ***sensor*** at which the focused image is acceptably shaped

02.04.31
depth of field(2)
range of distances over which a scanner can reliably ***read*** a ***symbol*** of given characteristics which is equal to the range of the scanner minus its **opt*ical throw***

cf. optical throw, range, and reading distance

02.04.32
field of view
FoV
length of bar code that can be read in one **scan**

NOTE For wand scanners and others where the scanner beam has to be manually moved across the symbol field of view is a function of the operator's ability to scan smoothly.

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02.04.33
auto discrimination
ability of a bar code ***reader*** to distinguish automatically between two or more ***symbologies***

02.04.34
label printing machine
in the context of these standards a device for producing ***bar code*** labels directly from data

02.04.35
laser engraver
device which uses concentrated heat from a ***laser*** beam to engrave graphic images directly on to an item to be marked

02.04.36
overprinting
printing on to pre-printed material

02.04.37
pixel
smallest element of a display surface that can be independently assigned attributes such as color and intensity

NOTE Synonymous with picture element

03.01.01
linear bar code symbol
graphic representation of data in the form of a combination of symbol characters and features required by a particular symbology, which together form a single-row complete scannable entity

NOTE Features include ***quiet zones***, ***start*** and ***stop characters***, ***data characters***, check characters and other auxiliary patterns

03.01.02
stop character/pattern
auxiliary character, which indicates the end (right hand side) of a bar code ***symbol***

03.01.03
overhead
part of a bar code ***symbol*** (consisting of the auxiliary characters and symbol ***check characters)*** required in addition to the symbol ***characters*** encoding data to give the ***symbol*** a valid structure

03.01.04
auxiliary character/pattern
non-Data ***character***

Example **start character**, **stop character**, center pattern, **delineator** pattern, **latch character** mode indicator, **shift character** code subset change characters, and function characters

NOTE adapted from [ISO/IEC 2382-4]

03.01.05
redundancy
characteristic whereby **information** is repeated to increase the probability of its being read or communicated successfully

NOTE In a bar code symbol the height of the bars provides vertical redundancy by enabling multiple **scan** paths to exist through the symbol, only one of which is necessary in theory for a complete **decode**

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03.01.06
vertical redundancy
property of a ***bar code symbol*** whereby there exist multiple possible scan paths as a result of the ***symbol*** being significantly higher than the height of a single scan line

03.01.07
wide: narrow ratio
ratio of the widths of wider ***elements*** in a ***symbol*** to those of narrow elements

03.01.08
intercharacter gap
space between the last ***bar*** of one symbol ***character*** and the first bar of the next in a discrete ***bar code*** symbology

03.01.09
two-width symbology
bar code symbology in which symbol ***characters*** consist only of narrow and wide ***elements*** the widths of which are in a constant ratio to each other

NOTE compare modular symbology

03.01.10
binary symbology
cf. two-width symbology

03.01.11
modular symbology
bar code ***symbology*** in which symbol ***characters*** are composed of ***elements*** the nominal widths of which are integer multiples of the ***X dimension*** or ***module*** width

NOTE see module, (n, k) symbology

03.01.12
continuous code
symbology in which there is no ***intercharacter gap*** , i.e. the final ***element*** of one ***symbol character*** abuts the first element of the next symbol character and all the elements carry data continuously. Compare; ***discrete code***

03.01.13
discrete code
symbology in which the spaces between symbol ***characters intercharacter gaps*** do not contain information as each ***character*** begins and ends with a ***bar***. Compare; ***continuous code***

03.01.14
omnidirectional
in all directions

NOTE used to refer to symbols that can be scanned in any orientation with an appropriate scanner, or to such a scanner

03.02.01
substitution error
character that is wrongly ***decoded*** when a bar code ***symbol*** is read

NOTE compare ***misread***

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03.02.02
symbol check character
symbol ***character*** calculated from the other symbol characters in a bar code ***symbol*** in accordance with an algorithm defined in the ***symbology*** specification and used to check that the ***bar code*** has been correctly composed and read

NOTE the symbol check character does not form part of the data encoded in the ***symbol***

03.02.03
modulo
type of **algorithm** used to calculate the check character for certain bar code symbols the result thereof being the remainder of the division of two integer numbers

NOTE Usually used in the form Modulo-10, Modulo-103, etc.

03.02.04
guard pattern
auxiliary pattern of ***bars*** and spaces corresponding to ***start*** or ***stop patterns*** in other symbologies, or serving to separate the two halves of a ***symbol***

03.02.05
ladder orientation
position of a ***bar code symbol*** in which the axis of the bars is horizontal in order to enable a vertical scanning beam to traverse the complete ***symbol***

NOTE compare picket fence orientation

03.02.06
picket fence orientation
position of a ***bar code symbol*** in which the axis of the ***bars*** is vertical in order to enable a horizontal scanning beam to traverse the complete ***symbol***

NOTE compare ladder orientation

03.02.07
odd parity
characteristic of the encodation of a symbol ***character*** whereby the ***character*** contains an odd number of dark ***modules***

03.02.08
even parity
characteristic of the encodation of a symbol ***character*** whereby the ***character*** contains an even number of dark ***modules***

03.02.09
variable parity encodation
process of encoding additional information in a series of symbol ***characters*** by using particular combinations of odd and ***even parity characters*** to implicitly encode digits or for checking purposes

03.02.10
fixed parity
bar code symbol or a defined section of a ***symbol*** has fixed parity if every symbol ***character*** has the same ***parity***, either even or odd

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03.02.11
bearer bar
bar abutting the tops and bottoms of the bars in a ***bar code symbol***, or a frame surrounding the entire ***symbol,*** intended to equalize the pressure exerted by the printing plate over the entire surface of the symbol and/or to prevent a short scan by the ***bar code reader***

03.02.12
short read
reading of an apparently valid shorter ***symbol*** within a longer one, of the same or different symbologies

03.02.13
truncation
providing a ***symbol*** with normal width but reduced height

03.02.14
bar code density
number of ***characters*** that can be represented in a ***bar code symbol*** per unit of measure usually expressed as ***characters per inch*** or per centimetre for ***linear bar codes*** and per square inch or per square centimetre for multi-row symbologies

NOTE The width of the narrowest ***bar*** or space, the ***wide: narrow ratio*** the number of bars and spaces per character and the width of the intercharacter gap, if any, are the controlling factors.

cf. symbol character

03.02.15
characters per inch
CPI
measure of bar code **density**

03.02.16
symbol density
cf. bar code density

03.02.17
zero-suppression
process of removing zeroes from specified positions in a GTIN-12 in order to encode it in UPC-E format

03.02.18
film master
bar code master on film

03.02.19
bar code master
original film or other image of a linear ***bar code symbol*** or ***two-dimensional symbol*** produced to close to tolerances and intended for reproduction by conventional printing processes

03.02.20
corner marks
not normally printed, marks which indicate the four corners of a ***bar code symbol*** including the light margins on a ***bar code master***

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03.02.21
bar width adjustment
BWA
amount of decrease in ***bar width reduction*** or increase ***bar width increase*** by which the ***bars*** of a ***bar code master*** are adjusted, to compensate respectively for ***gain*** or loss of bar width during reprographic and printing processes

03.02.22
bar width compensation
BWC
extent by which the widths of a bar in a bar code master or in a digital bar code file are reduced/increased in order to correct for expected print or image gain/loss

03.02.23
bar width gain/loss
for quality assurance see bar width adjustment

03.02.24
bar width increase
for quality assurance see bar width adjustment

03.02.25
bar width reduction
for quality assurance see bar width adjustment

03.02.26
printability gauge
series of specially calibrated marks printed on to a ***substrate*** to assess or monitor the quality of printing

03.02.27
magnification factor
constant multiplier applied to the nominal dimensions of a ***bar code symbol*** to obtain the actual dimensions at which it must be produced

03.02.28
integrated artwork
artwork in which the ***bar code symbol*** and the other graphics are generated together by electronic means

03.02.29
add-on symbol
symbol used to encode information supplementary to that in the main symbol

03.02.30
delineator
auxiliary pattern used to separate ***characters*** within an add-on ***symbol***

04.02.01
two-dimensional symbol
code representing data in machine-readable form by a collection of polygonal or circular cells in a regular pattern which are read optically by scanning

04.02.02
two-dimensional
(2D) symbols
optically readable symbols that must be examined both vertically and horizontally to read the entire message.

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Note Two-dimensional symbols may be one of two types: matrix symbols and multi-row symbols. Two-dimensional symbols have error detection and may include error correction features

04.02.03
fixed pattern
unique, non-data portions of a two-dimensional symbology including finder patterns, timing, navigation and other static components

04.02.04
matrix symbology
collection of polygonal or circular ***elements*** in a regular pattern to represent data for retrieval by a vision scanning system

04.02.05
dot code
subset of matrix symbologies in which individual ***modules*** are surrounded by clear space which has no information content

04.02.06
module(2)
matrix symbology symbol
in a ***matrix symbology***, a single cell or element used to encode one bit of the codeword

04.02.07
alignment pattern
fixed reference pattern in defined positions in a matrix ***symbology***, which enables the ***decode*** software to resynchronize the coordinate mapping of the image ***modules*** in the event of moderate amounts of distortion of the image

04.02.08
finder pattern
unique pattern in a ***symbology*** used to locate ***symbols*** conforming to the symbology rules within a field of view

04.02.09
multi-row symbology
bar code symbology in which the ***symbol*** consists of two or more vertically adjacent ***rows*** of symbol ***characters***

04.02.10
row
lateral set of components in a ***multi-row symbology***, comprising a ***start pattern*** a number of symbol ***characters***, and a ***stop pattern***

04.02.11
column
horizontal symbol ***character*** position in a ***row*** of a ***multi-row symbology***

04.02.12
stacked symbology
cf. multi-row symbology

04.02.13
(n,k) symbology
class of ***bar code*** symbologies in which each symbol ***character*** is n ***modules*** in width and is composed of k ***bar*** and space pairs

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04.02.14
composite symbol
linear symbol and two-dimensional symbol combination where the ***linear symbol*** can be read by itself or where the linear symbol and ***2D symbol*** are read as a single data message

04.02.15
compaction mode
name given to one of three data compaction algorithms in PDF417: Text, Numeric and Byte Compaction modes, which efficiently map 8-bit data bytes into PDF417 codewords

04.02.16
structured append
linking together in a predetermined sequence of the **data** contained in two or more symbols, enabling the data to be handled as a single **message**

04.02.17
data region
part of a symbol used to data code words as opposed to other symbol overhead

04.02.18
data codeword
codeword which ***encodes*** data according to one of the compaction schemes of a ***symbology***

04.02.19
error correction codeword
codeword in a ***symbol*** which ***encodes*** a value derived from the error correction codeword algorithm to enable ***decode*** errors to be detected and, depending on the ***error correction level*** to be corrected

04.02.20
error correction level
degree of error correction capability in a ***symbology***, where this is not fixed but subject to some user choice

04.02.21
erasure
type of error represented by a physically missing ***character***, or a symbol character which has failed to be ***decoded***, as opposed to a substitution ***error*** or misdecode

04.02.22
pad character
cf. Filler Character

04.02.23
pad codeword
codeword that is inserted to extend a codeword sequence, to achieve a desired symbol structure, or to fill the capacity of a symbol.

04.02.24
direct part marking
DPM
generic term referring to methods of applying a permanent mark directly onto the surface of an item

04.02.25
intrusive marking
subtractive marking
direct marking method designed to alter a surface to form a human or machine-readable mark

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04.02.26
non-intrusive marking
additive marking
direct marking method designed to add material to a surface to form a human or machine-readable mark

04.02.27
permanent marking
intrusive or non-intrusive markings that are designed to remain legible for at least the normal service life of an item

cf. concatenation

Information technology – AIDC techniques – Harmonized vocabulary, Abbreviations

ECI		Extended channel interpretation
DPM		direct part marking
BWA		bar width adjustment
BWC		bar width compensation
CPI		characters per inch
PCS		Print Contrast Signal
ORM		optically readable medium
FoV		field of view

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Information technology AIDC techniques - Harmonized vocabulary, Part 3 - Radio-Frequency Identification (RFID)

Techniques automatiques de la saisie d'identification et de données (AIDC)— Vocabulaire harmonisé — Partie 3: Identification de Radiofréquence (RFID)

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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.

ISO/IEC 19762 was prepared by ISO/IEC JTC 1/SC 31 – Automatic Identification and Data Capture Techniques, Vocabulary Rapporteur.

ISO/IEC 19762 consists of the following parts, under the general title *Information technology AIDC techniques - Harmonized vocabulary*:

Part 1: Information technology, AIDC techniques - Harmonized vocabulary - General terms relating to Automatic Identification and Data Capture (AIDC)

Part 2: Information technology, AIDC techniques - Harmonized vocabulary - Optically Readable Media (ORM)

Part 3: Information technology, AIDC techniques - Harmonized vocabulary - Radio-Frequency Identification (RFID)

Part 4: Information technology, AIDC techniques - Harmonized vocabulary – General terms relating to radio communications

Part 5: Information technology, AIDC techniques - Harmonized vocabulary – Locating systems

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Introduction

ISO/IEC 19762 is intended to facilitate international communication in information technology, specifically in the area of automatic identification and data capture (AIDC) techniques. It provides a listing of terms and definitions used across multiple AIDC techniques. Abbreviations used within each part of ISO/IEC 19762 and an index of all definitions used within each part of ISO/IEC 19762 are found following the end of each document.

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Information technology AIDC techniques – Harmonized vocabulary, Part 3 - Radio-Frequency Identification (RFID)

Scope

This part of ISO/IEC 19762 provides general terms and definitions in the area of automatic identification and data capture techniques on which are based further specialized sections in various technical fields, as well as the essential terms which should be used by non-specialist users in communication with specialists in automatic identification and data capture techniques.

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 19762-1, *Information technology AIDC techniques - Harmonized vocabulary, Part 1 - General terms relating to Automatic Identification and Data Capture (AIDC)*

ISO/IEC 19762-2, *Information technology AIDC techniques - Harmonized vocabulary, Part 2 - Optically Readable Media* (ORM)

ISO/IEC 19762-4, *Information technology AIDC techniques - Harmonized vocabulary, Part 4 – General terms relating to Radio Communications*

ISO/IEC 19762-5, *Information technology AIDC techniques - Harmonized vocabulary, Part 5 – Locating systems*

ISO/IEC 8824-1, *Information technology -- Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 15962, *Information technology -- Radio frequency identification (RFID) for item management -- Data protocol: data encoding rules and logical memory functions*

ISO/IEC 18000-6, *Information technology -- Radio frequency identification for item management -- Part 6: Parameters for air interface communications at 860 MHz to 960 MHz*

IEC 60050-712, *International Electrotechnical Vocabulary - Chapter 712: Antennas*

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Classification of entries

The numbering system employed within ISO 19762 is in the format nn.nn.nnn, in which the first two numbers (***nn***.nn.nnn) represent the “Top Level” reflecting whether the term is related to 01 = Common to All AIDC Techniques, 02 = Common to All Optically Readable Media, 03 = Linear Bar Code Symbols, 04 = Two-dimensional Symbols, 05 = General terms radio, 06 = Radio Frequency Identification, 07 = Real Time Locating Systems, and 08 = MIIM. The second two numbers (nn.***nn***.nnn) represent the “Mid Level” reflecting whether the term is related to 01 = Basic Concepts/Data, 02 = Technical Features, 03 Symbology, 04 = Hardware, and 05 = Applications. The third two or three numbers (nn.nn.***nnn***) represent the “Fine” reflecting a sequence of terms.

The numbering in this part of ISO/IEC 19762 employs “Top Level” numbers (**nn**.nn.nnn) of 05

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Terms and definitions

05.01.01
radio frequency identification
RFID
the use of electromagnetic, or inductive coupling in the radio frequency portion of the spectrum to communicate to or from a tag through a variety of modulation and encoding schemes to uniquely read the identity of an RF Tag

05.01.02
backscatter(1)
process whereby a **transponder** responds to a reader/interrogation signal or field by modulating and re-radiating or transmitting the response signal at the same carrier **frequency**

05.01.03
backscatter(2)
technique for retrieving information from a **tag** in which the narrow band energy from the **interrogator** is reflected back to the interrogator in varying degrees as the impedance of the tag **antenna** is modulated

05.01.04
awake
state at which the **tag's** receiver is powered, able to receive, and respond to a transmission from a compliant **interrogator**

05.01.05
enrolment
process by which a **tag** initially becomes associated with an **interrogator**

05.01.06
false activation
response due to the result of a 'foreign' or non-assigned **transponder** entering the **interrogation zone** of a radio frequency **identification** system and effecting a response, erroneous or otherwise

05.01.07
family of tags
group of **tags** with differing capabilities which are nevertheless capable of communicating ID numbers and/or data with a common **interrogator**

05.01.08
in field reporting
mode of operation in which a **reader/interrogator** reports a t**ransponder** ID when the transponder enters the **interrogation zone** and then periodically at a prescribed interval of time has elapsed while the tag remains in the interrogation zone

cf. out of field reporting

05.01.09
out of field reporting
mode of operation in which the identification of a **transponder** is reported as or once the transponder leaves the reader **interrogation zone**

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05.01.10
interrogation
process of communicating with, and reading a **transponder**

05.01.11
interrogation zone
region in which a **transponder** or group of transponders can be effectively read by an associated **radio frequency identification** reader/interrogator

05.01.12
tag ID
generic reference to either a manufacturer **tag ID** or user **tag ID**

05.01.13
user tag ID
user-defined **tag** identifier

NOTE The User **Tag ID** may not be a unique identifier.

05.01.14
manufacturer tag ID
reference number, which uniquely identifies the **tag**

05.01.15
orientation sensitivity
sensitivity of response for a **transponder** expressed as a function of angular variation or orientation

05.01.16
phantom transaction
report of a non-existent **tag**

05.01.17
INCITS T6
technical committee of the ANSI accredited standards developer responsible for the development of **RFID** technical standards within the United States

NOTE Formerly known as X3T6 and NCITS T6

05.01.18
rate
quantity of tags per unit time including impulse and steady state

NOTE Tag population will be both static and dynamic.

05.02.01
identify
process of tag segregation and isolation, resulting in a uniquely addressable means to communicate with a **tag** (the tag ID)

NOTE Application data has not been accessed

05.02.02
identification range
range at which an RFID system may reliably identify desired tags under defined conditions

05.02.03
identification rate
rate at which an RFID system may reliably identify desired tags under defined conditions

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05.02.04
read
process of tag transaction to retrieve information from identified tag population, including both single byte and multiple byte transactions

05.02.05
read range
range at which an RFID system may reliably read from desired tags under defined conditions

05.02.06
read rate
rate at which an RFID system may reliably read desired tags under defined conditions

05.02.07
write (1)
process of tag transaction to write information into identified tag population

NOTE This process will include both single byte and multiple byte transactions. Write with verification will be available.

05.02.08
write range
range at which an RFID system may reliably write to desired tags under defined conditions

05.02.09
write rate
rate at which an RFID system may reliably write to desired tags under defined conditions

05.02.10
pick rate
percentage detection rate for an **RF** system: This is a function the speed of throughput, **tag** orientation, number of tags present, etc

05.02.11
in-use programming
tags in read/write systems that have the ability to read from and **write** to a **transponder** while it is attached to the object or item for which it is being used

05.02.12
re-programmability
ability to change the data content of a **transponder** using a suitable **programming** device

cf. in-use programming

05.02.13
read only
transponder in which the data is stored in an unchangeable manner and can therefore only be read

cf. factory programming

05.02.14
field programming
programming information into the **tags** may occur after the tag has been shipped from the manufacturer to an OEM customer or end user or in some cases to the manufacturer's distribution locations

NOTE Field programming usually occurs before the tag is installed on the object to be identified. This approach enables the introduction of data relevant to the specifics of the application into the tag at any time; however, the tag would typically have to be removed from its object. In some cases, change or duplication of all data in the tag is possible. In other cases, some portion is reserved for factory **programming**. This might include a unique tag serial number, for example. Field programming is usually associated with **Write Once Read Many (WORM)** and **read/write (RW)** devices. The data entered into a **transponder** may be by a combination of factory and field programming.

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cf. Compare Factory Programming, Field Programming

05.02.15
factory programming
entering of data into a **transponder** as part of the manufacturing process, resulting in a read-only **tag**

cf. field programming

05.02.16
return link (**uplink**)
communications from **tag** to **Interrogator**

05.02.17
roaming
ability of a **tag** to move from one **interrogator's** cell to another

05.02.18
selection (RFID)
process by which an **interrogator** requests that a specific **tag** or subset of tags responds to the interrogator

05.02.19
separation
operational distance between two **tags** or between a tag and the **interrogator**

05.02.20
shadowing
condition in which an object located between an **interrogator** and a **tag** obscures the signals thus preventing a successful transaction

05.02.21
abstract syntax
for the OSI Presentation Service, specification of application layer **data** or application protocol control information by using notation rules that are independent of the encoding technique used to represent them

05.02.22
inventoried flag
flag that indicates whether a tag may respond to an interrogator; tags maintain a separate inventoried flag for each of four sessions, where each flag has symmetric A and B values within any given session, and in which interrogators typically inventory tags from A to B followed by a re-inventory of tags from B back to A (or vice versa)

05.02.23
inventory round
period initiated by a query command and terminated by either a subsequent query command (which also starts a new inventory round) or a select command

05.02.24
permalocked
memory location whose lock status is unchangeable (i.e. the memory location is permanently locked or permanently unlocked)

05.02.25
persistent memory
memory whose state is maintained during a brief loss of tag power

05.02.26
persistent flag
flag value whose state is maintained during a brief loss of tag power

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05.02.27
transfer syntax
abstract syntax and concrete syntax used in the transfer of data between open systems

NOTE The term "transfer syntax" is sometimes used to mean encoding rules, and sometimes used to mean the representation of bits in data while in transit.

05.02.28
type reference
name, in ASN.1 syntax, associated uniquely with a characteristic

EXAMPLE **ObjectId**

05.02.29
application family identifier
AFI
mechanism used in the **data protocol** and the air interface protocol to select a class of RFID tags relevant to an application, or aspect of an application, and to ignore further communications with other classes of RFID tags with different identifiers

05.02.30
data format
mechanism used in the **data protocol** to identify how **object identifiers** are encoded on the RFID tag, and (where possible) identify a particular data dictionary for the set of relevant object identifiers for that application

05.02.31
write once/read many
WORM
distinguishing a **transponder** that can be part or totally programmed once by the user, and thereafter only read

05.02.32
write protection
capability provided in the **tag** design which permits all or part of the memory to be shielded from modification, superimposition, or erasure

05.02.33
command / response unit
part of the **data protocol processor** that processes application commands and sends responses to control encoding, decoding, structuring of the **logical memory** and transfer to the **tag driver**

05.02.34
data compaction
mechanism or algorithm, to process the original data so that it is represented efficiently in fewer octets in a data carrier than in the original presentation

05.02.35
data compactor
implementation of the data compaction process defined in ISO/IEC 15962

05.02.36
data protocol processor
implementation of the processes defined in ISO/IEC 15962, including the **data compactor**, **formatter**, **logical memory**, and **command/response unit**

05.02.37
element name
component of a **reference type** or enumerated list in **ASN.1** syntax

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05.02.38
formatter
implementation of the data formatting process defined in ISO/IEC 15962

05.02.39
singulation
identifying an individual tag in a multiple-tag environment

05.02.40
slot
point in an inventory round at which a tag may respond; slot is the value output by a tag's slot counter; tags reply when their slot (i.e. the value in their slot counter) is zero

05.02.41
tag-identification layer
set of functions and commands used by an interrogator to identify and modify tags

NOTE also known as the operating procedure

05.02.42
octet
ordered sequence of eight bits considered as a unit, equivalent to an 8-bit byte

NOTE The term is used in preference to "byte" in this International Standard and in the ASN.1 standards to avoid confusion in cases where there is a hardware association e.g. 7-bit byte, 16-bit byte.

05.02.43
object
well-defined piece of information, definition, or specification that requires a name in order to identify its use in an instance of communication

05.02.44
object identifier
objectID
OID
value (distinguishable from all other such values) which is associated with an object

05.02.45
object identifier type
simple ASN.1 type whose distinguished values are the set of all object identifiers allocated in accordance with the rules of ISO/IEC 8824-1 (ITU-T X.680)

05.02.46
relative-OID
particular object identifier that constitutes the remaining arcs after the root-OID

05.02.47
root-OID
particular object identifier the constitutes the first, second and subsequent common arcs of a set of object identifiers (hence the common root)

NOTE The root-OID followed immediately by the relative-OID equates to the complete object identifier.

05.02.48
response
feedback received by the application from an application command sent to the **data protocol processor**

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05.02.49
batch reading
process or capability of a **radio frequency identification reader/interrogator** to read a number of **transponders** present within the system's **interrogation zone** at the same time

05.02.50
multiple readings
cf. batch reading

05.02.51
addressability (RFID)
ability to address bits, fields, pages, **files** or other defined areas of **memory** within a tag

05.02.52
continuous reporting
mode of **reader/interrogator** operation wherein the identification of a **transponder** is reported or communicated continuously while the transponder remains within the **interrogation** field

05.02.53
data field protection
facility to control access to and operations upon items or fields of data stored within the **transponder**

05.02.54
field protection
cf. data field protection

05.02.55
interoperability(1)
condition that exists between systems, from different vendors, to execute bi-directional data exchange functions, in a manner that allows them to operate effectively together

05.02.56
Interoperability(2)
guarantee of a certain level of compatibility between different implementations of the same standard

NOTE The desired level of compatibility is specific to a given standard, and can be limited to basic services. Interconnection and interoperability are the main objectives of standardization.

05.02.57
memory capacity
measure of the data expressed in bits or bytes, that can be stored in a **transponder**

NOTE the measure may relate simply to the bits that are accessible to the user or to the total assembly of bits, including data identifier and error control bits

05.02.58
signaling technique
complete description of the **modulation**, data encoding, protocol, and sequences required to communicate between **tags** and **interrogators**

05.02.59
tree algorithm
deterministic algorithm used by the **interrogator** which upon detection of a **collision** searches the available space of possible values of a tag-generated random number until all **tags** are resolved

05.02.60
application command
instruction issued from the application to the **data protocol processor** in order to initiate an action or operation with the RF tag(s) via the interrogator

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05.02.61
application memory
sometimes known as user memory, an area on the RF tag available for storing data written to it

05.02.62
arc
specific branch of an object identifier tree, with new arcs added as required to define a particular object

NOTE The top three arcs of all object identifiers compliant with ISO/IEC 9834-1 are defined in Annex A.

05.02.63
basic encoding rules
BER
one of several ASN.1 encoding methods

05.02.64
block
minimum number of bytes on an RF tag that can be in a write transaction, or read transaction, across the air interface

05.02.65
sleep cycle
periodic turning off of non-essential components within an **RF Tag** a means of reducing power demands on the battery

05.02.66
reader talks first
RTF
system in which an RF tag responds with an information signal only after being directed to do so by a reader/interrogator

05.02.67
tag talks first
TTF
communication initialized by a tag upon entering an interrogation field

NOTE The tag is the master, the interrogator the slave. If a communication is established the interrogator can also operate as the master.

05.02.68
tag initiated communication
capability of an active **tag** to transmit a signal to an **interrogator**, which will cause the Interrogator to recognize the **tag** and respond

cf. tag talks first

05.02.69
tag-to-tag communication
capability of **RF Tags** to communicate with each other as well as with an **interrogator**

05.02.70
bi-directional
capable of operating in either of two directions, which are the opposite of each other. For example, a tag that can be **read** or written from either side is bi-directional

05.02.71
proximity
term often used to indicate closeness of one system component with respect to another, such as that of a **transponder** with respect to a reader

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05.02.72
monolithic memory structure
memory storage that is addressable by a single addressing element

05.02.73
segmented memory structure
memory storage that is separated into separate elements and requires multiple addressing elements for access

05.02.74
system information
information held on the RF tag, or generated by unique features of the air interface, that specify **data protocol** parameters to establish the **logical memory** and other formatting rules

05.02.75
tag driver
implementation of the process to transfer data between the **data protocol processor** and the RF tag

05.02.76
training sequence
TSC
dedicated bit sequence to ease the reception for a receiver

05.02.77
random-slotted collision arbitration
collision-arbitration algorithm where tags load a random (or pseudo-random) number into a slot counter, decrement this slot counter based on interrogator commands, and reply to the interrogator when their slot counter reaches zero

05.02.78
logical memory
software analogue on the **data protocol processor** of the **logical memory map**

05.02.79
logical memory map
array of contiguous octets of memory on the RF tag, representing the application (or user) memory to be used exclusively for the encoding of **objects**, **OIDs** and their associated **precursor** on the RF tag

cf. compare to passive tag

05.04.01
passive tag
RFID device which reflects and modulates a carrier signal received from an interrogator

05.04.02
active tag
RFID device having the ability of producing a radio signal

05.04.03
unitized active tag
active **tag** or **transponder** in which the batteries are sealed within the device

05.04.04
asynchronous tag
RF **tag** whose timing is derived from internal, independent oscillator

NOTE In such systems data rates are independent of, and not aligned with, the reader's carrier cycles.

cf. synchronous tag

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05.04.05
synchronous tag
RF tag whose timing is aligned with each cycle of the reader's carrier

05.04.06
annunciator
device which can be attached to an **RF tag** which emits a visual or aural signal upon command for purposes of assisting in identifying a **tag** or tagged item

05.04.07
electronic label
alternative term for a **transponder** or **RF tag**

05.04.08
fixed RFID Equipment
FE
equipment required to interrogate, receive and interpret the data in the on-board equipment (on-board **transponders** in order to present the identification

05.04.09
interrogator
fixed or mobile data capture and identification device using a radio frequency **electromagnetic field** to stimulate and effect a modulated data response from a **transponder** or group of transponders present in the **interrogation zone**

05.04.10
reader/interrogator
reader/writer
electronic device for performing the process of retrieving data from and potentially transmitting data to a **transponder** and, as appropriate, the contention and error control management, and **channel** and source **decoding** required to recover and communicate the data entered at source

NOTE The device may also interface with an integral display and/or provide a parallel or serial communications interface to a **host** computer or industrial **controller**

05.04.11
memory modules
term for a **read/write** or re-programmable **transponder**

cf. active tag

05.04.12
RF module/stage
part of a **reader/interrogator** that creates and receives the **RF** signals

05.04.13
automatic equipment identification
(AEI) system of identification for equipment that uses the surface transportation infrastructures by means of **transponders** and **interrogators** combined with an unambiguous data structure

05.04.14
radio frequency identification system
automatic identification system and data capture system comprising one or more reader/interrogators and one or more **transponders** in which data **transfer** is achieved by means of suitably modulated inductive or radiating electromagnetic **carriers**

NOTE In such systems **data rates** are derived from and aligned with the reader's carrier cycles.

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05.04.15
AFI tag
ISO/IEC 18000-6 Type C or 18000-3 Mode 3 tag with Protocol Control bit 17 set at “1’ indicating that what follows is an Application Family Identifier (AFI)

05.04.16
EPC tag
ISO/IEC 18000-6 Type C or 18000-3 Mode 3 tag with Protocol Control bit 17 set at “0’ indicating that what follows is an EPC header

05.04.17
proximity sensor
electronic device that detects and signals the presence of a selected object

NOTE When used in association with a **radio frequency identification** system the **sensor** is set up to sense the presence of a tagged or **transponder** carrying object when it enters the vicinity of the **reader/interrogator** so that the reader can then be activated to effect a **read**.

05.05.01
dense-interrogator environment
operating environment within which most or all of the available channels are occupied by active interrogators

EXAMPLE 50 active interrogators operating in 50 available channels

05.05.02
dense-interrogator mode
set of interrogator-to-tag and tag-to-interrogator signaling parameters used in dense-interrogator environments

05.05.03
single-interrogator environment
operating environment (defined above) within which there is a single active interrogator at any given time

05.05.04
multiple-interrogator environment
operating environment within which a modest number of the available channels are occupied by active interrogators

EXAMPLE 10 active interrogators operating in 50 available channels

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Information technology – AIDC techniques – Harmonized vocabulary, Abbreviations

AFI		application family identifier
BER		basic encoding rules
FE		fixed RFID Equipment
OID		object identifier
RFID		radio frequency identification
RTF		reader talks first
TSC		training sequence
TTF		tag talks first
WORM		write once/read many

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Information technology AIDC techniques - Harmonized vocabulary, Part 4 - General terms relating to radio communications

Techniques automatiques de la saisie d'identification et de données (AIDC)— Vocabulaire harmonisé — Partie 4: Limites générales concernant des communications par radio

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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.

ISO/IEC 19762 was prepared by ISO/IEC JTC 1/SC 31 – Automatic Identification and Data Capture Techniques, Vocabulary Rapporteur.

ISO/IEC 19762 consists of the following parts, under the general title *Information technology AIDC techniques - Harmonized vocabulary*:

Part 1: Information technology, AIDC techniques - Harmonized vocabulary - General terms relating to Automatic Identification and Data Capture (AIDC)

Part 2: Information technology, AIDC techniques - Harmonized vocabulary - Optically Readable Media (ORM)

Part 3: Information technology, AIDC techniques - Harmonized vocabulary - Radio-Frequency Identification (RFID)

Part 4: Information technology, AIDC techniques - Harmonized vocabulary – General terms relating to radio communications

Part 5: Information technology, AIDC techniques - Harmonized vocabulary – Locating systems

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Introduction

ISO/IEC 19762 is intended to facilitate international communication in information technology, specifically in the area of automatic identification and data capture (AIDC) techniques. It provides a listing of terms and definitions used across multiple AIDC techniques. Abbreviations used within each part of ISO/IEC 19762 and an index of all definitions used within each part of ISO/IEC 19762 are found following the end of each document.

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Information technology AIDC techniques – Harmonized vocabulary, Part 4 – General terms relating to radio communications

Scope

This part of ISO/IEC 19762 provides general terms and definitions in the area of automatic identification and data capture techniques on which are based further specialized sections in various technical fields, as well as the essential terms which should be used by non-specialist users in communication with specialists in automatic identification and data capture techniques.

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 19762-1, *Information technology AIDC techniques - Harmonized vocabulary, Part 1 - General terms relating to Automatic Identification and Data Capture (AIDC)*

ISO/IEC 19762-2, *Information technology AIDC techniques - Harmonized vocabulary, Part 2 - Optically Readable Media* (ORM)

ISO/IEC 19762-3, *Information technology AIDC techniques - Harmonized vocabulary, Part 3 – Radio-Frequency Identification (RFID)*

ISO/IEC 19762-5, *Information technology AIDC techniques - Harmonized vocabulary, Part 4 Locating systems*

ISO/IEC 2382-9, *Information technology -- Vocabulary -- Part 9: Data communication*

IEC 60050-121, *International Electrotechnical Vocabulary - Part 121: Electromagnetism*

IEC 60050-161, *International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility*

IEC 60050-702, *International Electrotechnical Vocabulary - Chapter 702: Oscillations, signals and related devices*

IEC 60050-704, *International Electrotechnical Vocabulary - Chapter 704: Transmission*

IEC 60050-705, *International Electrotechnical Vocabulary - Chapter 705: Radio wave propagation*

IEC 60050-712, *International Electrotechnical Vocabulary - Chapter 712: Antennas*

IEC 60050-713, *International Electrotechnical Vocabulary - Part 713: Radiocommunications: transmitters, receivers, networks and operation*

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IEC 60050-714, *International Electrotechnical Vocabulary - Chapter 714: Switching and signalling in telecommunications*

IEC 60050-725, *International Electrotechnical Vocabulary - Chapter 725: Space radiocommunications*

Classification of entries

The numbering system employed within ISO 19762 is in the format nn.nn.nnn, in which the first two numbers (***nn***.nn.nnn) represent the "Top Level" reflecting whether the term is related to 01 = Common to All AIDC Techniques, 02 = Common to All Optically Readable Media, 03 = Linear Bar Code Symbols, 04 = Two-dimensional Symbols, 05 = General terms radio, 06 = Radio Frequency Identification, 07 = Real Time Locating Systems, and 08 = MIIM. The second two numbers (nn.***nn***.nnn) represent the "Mid Level" reflecting whether the term is related to 01 = Basic Concepts/Data, 02 = Technical Features, 03 Symbology, 04 = Hardware, and 05 = Applications. The third two or three numbers (nn.nn.***nnn***) represent the "Fine" reflecting a sequence of terms.

The numbering in this part of ISO/IEC 19762 employs "Top Level" numbers (**nn**.nn.nnn) of 06

Terms and definitions

06.01.01
radio frequency
frequency of a periodic radio wave or of the corresponding periodical electrical oscillation

NOTE This term and its abbreviation may qualify an electrical device for generating or collecting radiated waves.

[IEC 60050-713:1998 713-06-02]
NOTE Radio Frequency (RF) (in RID). Radio frequency between 30 Hz and 3 GHz

06.01.02
radio frequency data communication
RF/DC
system by which remote devices communicate with a host computer via a radio link

NOTE 1 Hand-held **readers** can send the **information** collected back to a controlling process without the need for fixed wiring for the **data** cables.

NOTE 2 One common use for RF/DC is on forklift trucks.

06.01.03
electromagnetic field
field characterizing the electric and magnetic conditions of a material medium or of vacuum, defined by the following set of four vector quantities:

E: electric field (vector)

D: electric flux density (vector)

H: magnetic field (vector)

B: magnetic flux density (vector)

[adapted from IEC 50 (705):1995 705-01-07]

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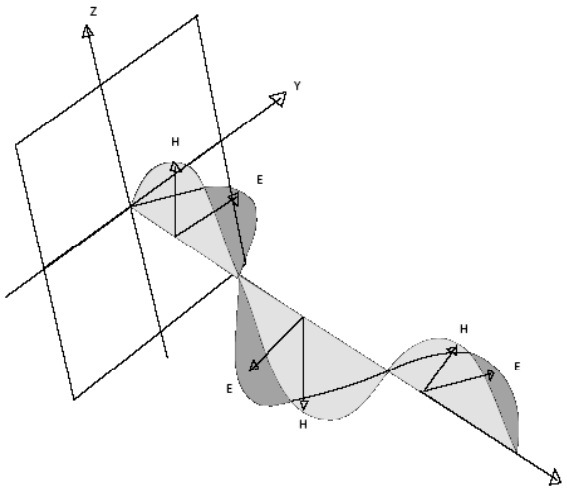


Figure 1 – Electromagnetic field

06.01.04
air interface
conductor-free medium, usually air, between a **transmitter** and the **receiver** through which communication, e.g., data and telemetry, is achieved by means of a modulated inductive or propagated **electromagnetic field**

[IEC 60050-702 702-06-17]

06.01.05
electromagnetic spectrum
range or continuum of electromagnetic radiation, characterized in terms of frequency or wavelength

06.01.06
electromagnetic wave
wave characterized by the propagation of a time-varying electromagnetic field

NOTE An electromagnetic wave is produced by variations of electric charges or electric currents.

[IEC 50 (705):1995 705-01-09]

06.01.07
electric field
constituent of an electromagnetic field which is characterized by the electric field strength ***E*** together with the electric flux density ***D***

NOTE In French, the term “champ électrique” is also used for the quantity electric field strength.

[IEC 60050-121 121-11-67]

06.01.08
far field region
region of an electromagnetic field of an antenna wherein the predominant components of the field are those which represent a propagation of energy and wherein the angular field distribution is essentially independent of the distance from the antenna

[IEC 50 (712):1992 712-02-02]

NOTE 1 In the far field region, field distribution is unaffected by the **antenna** structure and the wave propagates as a plane wave.

cf. Near Field

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06.01.09
magnetic field
constituent of an electromagnetic field which is characterized by the magnetic field strength ***H*** together with the magnetic flux density ***B***

[221-01-01 MOD]
NOTE In French, the term “champ magnétique” is also used for the quantity magnetic field strength.

[IEC 60050-121 121-11-69]

06.01.10
inductive coupling
process of transferring modulated data or energy from one system component to another, reader to **transponder** for example, by means of a varying magnetic field

NOTE An inductive coupled **tag** uses a coil to transfer data or power from the magnetic field output by an **interrogator**

06.01.11
electromagnetic coupling
coupling through a **magnetic field** also referred to as inductive **coupling** or an **electric field**

06.01.12
field strength
transmitter field intensity (deprecated)
magnitude of the electromagnetic field created at a given point by a radio transmitting system operating at a specified characteristic frequency with specified installation and modulation conditions

[IEC 50 (705):1995 705-08-31]

06.01.13
equivalent isotropically radiated power
EIRP
product of the net radiated **RF** power of a **transmitter** and the **gain** of an **antenna** system in one direction relative to an isotropic source

NOTE The maximum power **gain** of a transmitting antenna in any direction multiplied by the net power accepted by the antenna from the connected transmitter.

Example: 36 dBm EIRP equals 4 W transmitted into an isotropic antenna, or 1W transmitted into a 6dB antenna.

NOTE Also referred to as Effective Isotropically Radiated Power, Equivalent Isotropical Radiated Power, and Effective Isotropical Radiated Power

06.01.14
Effective Radiated Power
ERP

amount of power actually radiated by a transmitter and antenna combination (the applied power multiplied by the efficiency of the antenna)

cf. EIRP

NOTE To convert between ERP and EIRP, add 2.15 dB, as a dipole antenna has a gain of 2.15 dBi. For example to convert the European Power output of 2W ERP (which is +33 dBm) to EIRP, add 2.15 dB to get +35.15 dBm, which is very close to the FCC limit of 4W EIRP (+36 dBm).

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06.01.15
frequency
number of cycles a periodic signal executes in unit time. Usually expressed in Hertz (cycles per second) or appropriate weighted units such as **kilohertz (kHz), megahertz (MHz) and gigahertz (GHz)**

[ISO/IEC2382-9:199509.03.07] frequency band

continuous set of frequencies lying between two specified limiting frequencies

NOTE 1 A frequency band is characterized by two values which define its position in the frequency spectrum, for instance its lower and upper limiting frequencies, as opposed to the bandwidth which is characterized by one value.

NOTE 2 The nomenclature of the frequency and wave length bands used in RFID are given in Table 1

NOTE 3 Certain frequency ranges are sometimes designated by letter symbols consisting of capital letters which may be accompanied by a small letter as subscript.

NOTE 4 Adapted from [IEC 60050-713]

Table 1 – Nomenclature of frequency and wavelength bands

BAND NUM-BER (note a)	ABBRE-VIATION	FREQUENCY RANGE (lower limit exclusive, upper limit exclusive)				METRIC QUALIFIER (note d)	METRIC ABBRE-VIATION of the band	WAVELENGTH RANGE (lower limit exclusive, upper limit exclusive)			
-1	(note b)	0,03	to	0,3	Hz	gigametric	B.Gm	1	to	1	Gm
0	(note b)	0,3	to	03	Hz	hectomegametric	B.hMm	100	to	1000	Mm
1	(note b)	3	to	30	Hz	decamegametric	B.daMm	10	to	100	Mm
2	(note b)	30	to	300	Hz	megametric	B.Mm	1	to	10	Mm
3	ULF	300	to	3000	Hz	hectokilometric	B.hkm	100	to	1000	km
4	VLF	3	to	30	kHz	myriametric	B.Mam	10	to	100	km
5	LF	30	to	300	kHz	kilometric	B.km	1	to	10	km
6	MF	300	to	3000	kHz	hectometric	B.hmm	100	to	1000	m
7	HF	3	to	30	MHz	decametric	B.dam	10	to	100	m
8	VHF	30	to	300	MHz	metric	B.m	1	to	10	m
9	UHF	300	to	3000	MHz	decimetric	B.dm	100	to	1000	mm
10	SHF	3	to	30	GHz	centimetric	B.cm	10	to	100	mm

NOTE 1 “Band number N” extends from 0,3×10N to 3×10N Hz

NOTE 2 The abbreviation ELF designates the set of bands –1 to 2.

NOTE 3 In French, abbreviations with letter O (“Ondes”) are sometimes used (e.g. O.km “Ondes kilométriques”) instead of abbreviations with letter B (“Bande”) indicated in the column “metric abbreviation” of the table.

NOTE 4 Metric qualifiers and abbreviations are not names or symbols of unit, and so may use the combination of prefixes in some cases.

Adapted from [IEC 60050-713].

06.01.16
kilohertz
kHz
measure of **frequency** equal to one thousand (1,000) cycles per second.

06.01.17
Megahertz
MHz
measure of **frequency** equal to one million (1,000,000) cycles per second.

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06.01.18
gigahertz
GHz
measure of **frequency** equal to one billion (1,000,000,000) cycles per second

06.01.19
continuous wave
typically sinusoidal wave at a given frequency, but more generally any interrogator waveform suitable for powering a passive tag without amplitude and/or phase modulation cover-coding method by which an interrogator obscures information that it is transmitting to a tag

NOTE to cover-code data or a password an interrogator first requests a random number from the tag, then performs a bit-wise EXOR of the data or password with the received random number, and, finally, transmits the cover-coded (also called ciphertext) string to the tag; the tag uncovers the data or password by performing a bit-wise EXOR of the received cover-coded string with the original random number

06.01.20
modulation
process by which at least one characteristic quantity of a **carrier** is varied in accordance with a characteristic quantity of a signal to be transmitted

[ISO/IEC 2382-9:1995 09.05.10]

NOTE 1 Generic forms of modulation include amplitude **modulation (AM), phase modulation (PM) frequency modulation (FM)**, **pulse position modulation (PPM),** and **pulse width modulation (PWM).**

NOTE 2 Digital modulation methods principally feature **amplitude shift keying (ASK), frequency shift keying (FSK) phase shift keying (PSK)** or variants.

NOTE 3 See also Amplitude, Frequency and Phase Modulation, Amplitude Shift Keying, Frequency Shift Keying and Phase Shift Keying

06.01.21
amplitude modulation
modulation in which the amplitude of a periodic carrier is a given function, generally linear, of the instantaneous values of the modulating signal

06.01.22
phase modulation
PM
data is contained in the changes in the phase of the **carrier** in which the instantaneous phase deviation varies in accordance with a given function, generally linear, of the instantaneous value of the modulating signal

[IEC 60050-702 702-06-36]

06.01.23
pulse position modulation
PPM
data is contained in the position of pulses relative to a reference point

NOTE Pulse time modulation in which the positions in time of the pulses vary from their initial position in accordance with a given function of the value of the modulating signal

[IEC 60050-702 702-06-56]

06.01.24
pulse duration modulation(1)
PDM
pulse time modulation in which the pulse duration varies in accordance with a given function of the value of the modulating signal

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[IEC 60050-702 702-06-57]

06.01.25
pulse duration modulation(2)
PDM
data is contained in the duration of pulses, in which the pulse duration varies in accordance with a given function of the value of the modulating signal

[IEC 60050-702 702-06-57]

06.01.26
pulse position modulation
PPM
data is contained in the position of pulses relative to a reference point

06.01.27
pulse width modulation
PWM
synonym for **pulse duration modulation (PDM)**

06.01.28
spread spectrum modulation
form of modulation in which the average power spectral density of the transmitted signal is spread in a random or quasi-random way over a bandwidth which is much wider than the bandwidth required for the information to be transmitted

NOTE spread spectrum modulation permits multiple accesses to a communication path and increases immunity to noise and interference.

[IEC 60050-725 725-14-30]

06.01.29
spreading sequence
pseudo-random sequence of **data coding** elements **chips** used to encode each logical bit

06.01.30
direct sequence spread spectrum modulation
DSSS
form of spread spectrum modulation in which each element of a digital information signal is transmitted as a pseudo-random sequence of digits having a digit-rate much higher than the bit rate of the information signal

NOTE The signal modulating the carrier is usually obtained by adding a pseudo-random digital signal to the information signal.

[IEC 60050-725 725-14-31]

06.01.31
Frequency Hopping Spread Spectrum modulation
FHSS
form of spread spectrum modulation in which the carrier frequency is automatically changed at short intervals, selection being made in a pseudo-random way from a set of frequencies covering a frequency band much wider than the bandwidth required for the information to be transmitted

Adapted from [IEC 50 (725) 725-14-32]

06.01.32
frequency hop rate
frequency at which a frequency hopping spread spectrum **(FHSS)** system moves between transmission frequencies, equal to the reciprocal of the dwell time at a FHSS centre frequency

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06.01.33
hop rate
inverse of the dwell time at a given **FHSS** hopping frequency

06.01.34
frequency hop sequence
pseudo-random binary sequence **(PRBS)** determining the hopping frequencies used in frequency hopping spread spectrum **(FHSS)** systems

06.01.35
hop sequence
pseudo-randomly ordered list of hopping frequencies used by the **FHSS transmitter** to select an **FHSS channel**

06.01.36
chip rate
frequency at which the spreading **sequence** modulates the **carrier**

06.01.37
chipping
process of moving from one chip to another in a spread **spectrum** transmission process, each chip being representative of a different spectral component or tone in the spread spectrum band

06.01.38
amplitude shift keying
ASK
modulation in which a modulating digital signal Varies the amplitude of the output signal among a fixed number of predetermined values

06.01.39
frequency shift keying(1)
FSK
angle modulation in which each significant condition of a discretely timed modulating signal is represented by one of a specified set of discrete values of the frequency of the modulated signal

[IEC 60050-702 702-06-47]

06.01.40
frequency shift keying(2)
FSK
modulation in which a modulating digital signal varies the frequency of the output signal among a fixed number of predetermined values

[ISO/IEC 2382-9 09.05.13]

06.01.41
gaussian minimum shift keying
GMSK
gaussian pulse shaped ***MSK***

06.01.42
binary phase shift keying
BPSK
modulation scheme of phase modulation where only 2 points in a constellation diagram are used

06.01.43
differential binary phase shift keying
DBPSK
before **binary phase shift keying** the data is differential pre-processed

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06.01.44
minimum shift keying
MSK
form of two-condition frequency shift keying with modulation index equal to 0, 5, in which variations are continuous

[IEC 60050-702 702-06-49]

06.01.45
phase shift keying
PSK
angle modulation in which each significant condition in a discretely timed modulating signal is represented by a specified difference between the phase of the modulated signal and the phase of the carrier in the absence of modulation

[IEC 60050-702 702-06-40]

06.01.46
absolute gain
isotropic gain
of an antenna, in a given direction, the ratio, generally expressed in decibels, of the radiation intensity produced by an antenna in a given direction to the radiation intensity that would be obtained if the power accepted by the antenna were radiated equally in all directions

NOTE 1 If no direction is specified, the direction of maximum radiation intensity from the given antenna is implied.

NOTE 2 If the antenna is lossless its absolute gain is equal to its directivity in the same direction.

[IEC 50 (712):1992 712-02-43]

06.01.47
acknowledgment signal
signal sent in one direction to acknowledge the receipt of a signal in the opposite direction

[IEC 50 (714) 714-07-22]

06.01.48
asynchronous transmission(1)
method of data transmission that does not require timing or clocking **information** in addition to data

NOTE Transmission is achieved by receiver reference to start and stop bits positioned at the beginning and end of each character or blocks of characters. A variable time interval can exist between characters or blocks of characters.

06.01.49
asynchronous transmission(2)
data transmission in which the start of each character or block of characters is arbitrary but, once started, signal elements are transmitted at a predetermined fixed rate

06.01.50
authentication
message exchange between two **elements**, which verifies that further communication between the two items is proper

06.01.51
bandwidth times time
term to specify the product of bandwidth and time used for 1 Bit: BT implicitly specifies the occupied bandwidth for a given data rate

06.01.52
carrier
wave or an oscillation whose characteristic quantities may be varied by signal

NOTE The wave or oscillation may be, for example, a sinusoidal wave or a pulse train. In modulation, an oscillation or wave, usually periodic, some characteristic of which follows by modulation the signal or of another oscillation or wave.

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[ISO/IEC 2382-9 09.05.09] [IEC 60050-702 702-06-03] [IEC 60050-704 704-10-02]

06.01.53
carrier frequency
analog signal of fixed amplitude and frequency

06.01.54
carrier signal
signal of chosen frequency generated to carry data, often used for long distance transmissions

NOTE A **carrier signal** does not convey any information until the data is added to the signal by **modulation**, then decoded on the receiving end by demodulation

06.01.55
channel
(transmission path)
course taken by a signal during its transmission between two points

[IEC 60050-704 704-04-01]

06.01.56
channel encoding
application of coding schemes to facilitate effective **channel** transmission of the source encoded data

cf. Compare Source encoding. See also channel decoding

06.01.57
channel decoding
process of operating upon a received transmission to separate the source-encoded data from the channel **encoded** form

cf. Compare Source decoding See also Channel encoding

06.01.58
source decoding
process of recovering the original or source **data** from a received source encoded bit stream

cf. source encoding

06.01.59
source encoding
process of operating upon original or source **data** to produce an encoded message for transmission

cf. source decoding
[IEC 60050-702 702-04-40]

06.01.60
collision avoidance
multiple access protocol which allows for resolution of **collisions** Examples include tree search **algorithms** and various **ALOHA** methods, including **CSMA**

06.01.61
collision(1)
simultaneous communication by two or more **tags** in the field of view of an **interrogator**, which results in an error or lost transmission

NOTE Such communication may be inseparable without some means of anti-collision or contention management.

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06.01.62
collision(2)
condition that results from concurrent transmissions on the transmission medium

NOTE In hashing, the occurrence of the same hash value for two or more different keys.

06.01.63
Carrier Sense Multiple Access(1)
CSMA
multiple access protocol that allows the **tag** to "sense" whether another tag is using the **channel** prior to transmitting itself

06.01.64
Carrier Sense Multiple Access(2)
CSMA
multiple access technique where data stations mediate their own use of the common resource based upon presence or absence of a ***carrier*** from another user

06.01.65
Carrier Sense Multiple Access with Collision Detection
CSMA/CD
multiple access protocol that allows the **tag** to "sense" whether another tag is using the **channel** prior to transmitting itself; and to detect a **collision**, if one occurs

06.01.66
code division multiple access(1)
CDMA
technique that breaks each transmission into **packets** and assigns a unique code to each

NOTE All coded packets are then combined mathematically into one signal and each intended receiver extracts only its data packets depending on the assigned code.

06.01.67
code division multiple access(2)
CDMA
multiple accesses that depends upon the use of independently coded **modulations** within a single channel

06.01.68
ALOHA(1) random
multiple access protocol in which **tags** respond to the **interrogator** after a random time interval

06.01.69
ALOHA(2) slotted
multiple access protocol in which tags respond to the interrogator after selecting a random time slot

06.01.70
directivity
ratio, generally expressed in decibels, of the radiation intensity produced by an antenna in a given direction, to the value of the radiation intensities averaged in all directions in space

NOTE 1 If no direction is specified, the direction of maximum radiation intensity from the given antenna is implied.

NOTE 2 The directivity is independent of antenna losses and equal to the absolute gain in the same direction if the antenna is lossless.

[IEC 50 (712):1992 712-02-42]

06.01.71
down-link
radio link between a transmitting space station and receiving earth station

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[IEC 60050-725 725-12-24]

06.01.72
duplex transmission
data transmission in both directions at the same time

[ISO/IEC 2382-9:1995 09.03.07]

06.01.73
full-duplex transmission(1)
data is communicated while the **transceiver** transmits the activation field

06.01.74
interlaced half duplex
full duplex transmissions by the **interrogator**; **half duplex** operation by the **tag**

06.01.75
emission
radio waves or signals produced by a radio transmitting station

NOTE 1 In radio communication the term “emission” should not be used in the more general sense of “radio frequency emission”. For example, that part of electromagnetic energy from the local oscillator of a radio receiver transferred to external space is a radiation and not an emission.

NOTE 2 In radio communication the French term “emission” applies only to intentional radiation.

[IEC 60050-702 702-02-05]

06.01.76
electromagnetic interference
EMI
degradation in the performance of an equipment transmission channel or system caused by an electromagnetic disturbance

[IEC 600500-161-01-06 (702-08-29]

06.01.77
electromagnetic noise
time-varying electromagnetic phenomenon apparently not conveying information and which may be superimposed on or combined with a wanted signal

[IEC 600500-161-01-02]

06.01.78
immunity
ability of a device, equipment or system to perform without degradation in the presence of an electromagnetic disturbance

[IEC 60050-161 161-01-20]

06.01.79
radio-frequency disturbance
electromagnetic phenomenon having components in the radio-frequency range, which may degrade the performance of a device, equipment or system, or adversely affect living or inert matter

NOTE A radio-frequency disturbance may be a **radio-frequency noise**, an unwanted signal or a change in the propagation medium itself.

[IEC 60050-713:1998 713-11-04]

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06.01.80
radio-frequency interference
RFI
degradation of the reception of a wanted signal caused by a radio-frequency disturbance

[IEC 60050-713:1998 713-11-05]

NOTE Unwanted electromagnetic signals, where encountered within the environment of a **radio frequency identification** system, that cause disturbance in its normal operation, possibly resulting in bit errors, and degrading system performance.

06.01.81
radio frequency noise
time-varying electromagnetic phenomenon having components in the radio-frequency range, apparently not conveying information and which may be superimposed on, or combined with, a wanted signal

[IEC 60050-713:1998 713-11-03]

06.01.82
de-tuning
effect of a change of the resonance frequency of an RF tag and/or **readers/interrogators** caused by the close **proximity** of metal or a dielectric material, thus causing a reduction in performance of **transponders**

06.01.83
ETR
European Telecommunications Report
ETSI document created as an output of a work Item in the ETSI work program

NOTE An ETR has a lower stature than an **ETS**

06.01.84
ETS
European Telecommunications Standard
ETSI document created as an output of a work Item in the ETSI work program, and has the status of a European standard

06.01.85
ETSI
European Telecommunications Standards Institute
European standards organization responsible for standardization in telecommunications

06.01.86
harmonics
power output at integer multiples of the primary frequency of a **transmitter** invariably exhibiting lower amplitudes. Harmonics can be generated as a result of circuit non-linearity's associated with radio transmissions resulting in harmonic distortion

06.01.87
isotropic radiator
hypothetical antenna, without loss, having equal radiation intensities in all directions and serving as a convenient reference for expressing the directional properties of actual antennas

IEC 50(712) 712-03-01]

06.01.88
non interference
RFID condition that exists where standard compliant components of various types or of different vendor origins co-exist within the same space without serious detrimental effect on one another's performance; Components are not required to communicate with one another as part of a common infrastructure, but only to peacefully co-exist

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06.01.89
penetration
ability of **electromagnetic waves** to propagate into or through materials

NOTE 1 Non-conducting materials are essentially transparent to electromagnetic waves, but absorption mechanisms, particularly at higher frequencies, reduce the amount of energy propagating through the material.

NOTE 2 Metals constitute good reflectors for freely propagating electromagnetic waves, with very little of an incident wave being able to propagate into the metal surface.

NOTE 3 Low frequency tagging systems are said to have good penetrative properties as their **tag** can be read when behind or encased in other materials.

NOTE 4 Microwave tagging systems, while having greater ranges, are less capable of penetration of materials.

06.01.90
polarization
attribute of an electromagnetic wave characterized by the curve described with time by the extremity of the electric flux density vector at a fixed point, and by the direction of this curve

[IEC 50(705) 705-01-13]

06.01.91
polarization summary
polarization of a propagating wave is determined by the locus or path described by the electric field **vector** with respect to time

NOTE polarization is a term that often arises in the literature and when considering radio frequency communication and RFID. If we ascribe an x, y, z co-ordinate system to a propagating wave as illustrated below, with the direction of propagation being in the z direction, the electric field vector, E will be in the x, y plane. If E remains in the same orientation with respect to time, so that its locus describes a straight line, the wave is said to be linearly polarized. However, if the locus describes a circular motion with respect to time the wave is said to be circularly polarized. Where the locus describes an elliptical path the wave is said to be elliptically polarized.

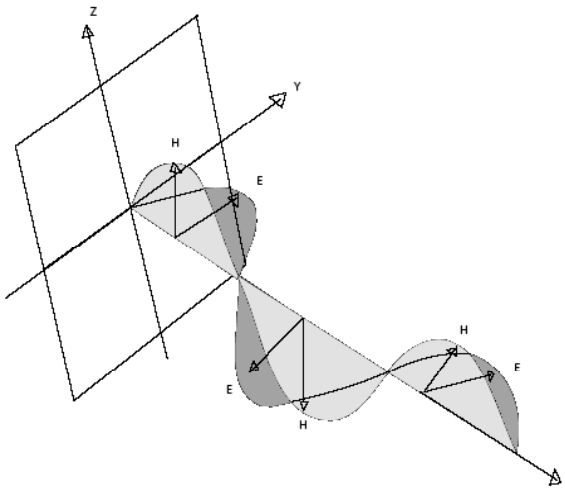


Figure 2 – Electromagnetic field

Circular polarization is often used in communication systems since the orientation of the transmitting and receiving **antenna** is less important than it is with linearly polarized waves. The magnetic vector, H, always remains perpendicular to the E vector. Using an IEEE convention, a clockwise circular rotating wavefront approaching a receiver is defined as being left-hand circular (LHC) polarized. The power in the wavefront is expressed in the form of the Poynting vector, P = (E x H(= E x H sin (, where (is the phase angle between E and H.

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06.01.92
alignment
orientation of the **tag** relative to the reader **antennas,** in terms of the variation of the tags x, y and z positions

06.01.93
antenna polarization
in an **antenna** system the focus of the tip of the **vector** of the electrical **field strength** in a plane perpendicular to the transmission vector

06.01.94
polling
process whereby data stations are invited one at a time to transmit

NOTE While generally used on a multipoint connection, polling can be used on a point-to-point connection.

[ISO/IEC 2382-9 09.06.24]

06.01.95
power flux density
power passing through an element of surface normal to the direction of propagation of energy of an electromagnetic wave divided by the area of the element

[ICE 50(705) 705-02-03]

06.01.96
power gain
in a given direction, the field intensity radiated by a transmitting **antenna** referenced to the field intensity that would be radiated by an isotropic antenna provided the same input power

NOTE 1 Power gain includes dissipative loss, in contrast to directive **gain**

NOTE 2 Power gain does not include losses resulting from **polarization** mismatch

06.01.97
programmability
ability to enter data and to change data and functions stored in a **transponder**

06.01.98
programming
act of entering or changing data stored in a **transponder**

06.01.99
projected life
estimated lifetime for a **transponder** often expressed in terms of read and/or **write** cycles or, for active **transponders**, years, based upon battery life expectancy and, as appropriate, **read/write** activity

06.01.100
pulse dispersion
spread in width or duration of a pulse during transmission through a practical transmission system, due to the influence of distributed reactive components

06.01.101
Q factor
quality factor
ratio of the center frequency to the **bandwidth**

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06.01.102
radiating near field
region of space between the reactive near field region and the far field region, wherein the predominant components of the electromagnetic field are those which represent a propagation of energy, and wherein the angular field distribution is dependent upon the distance from the antenna

NOTE If the antenna has a maximum overall dimension which is not large compared to the wavelength, the radiating near field region may not be identifiable in practice.

[IEC 50(712) 712-02-04]

06.01.103
radiation
phenomena by which energy in the form of electromagnetic waves emanates from a source into space

Note Associated term: to radiate

[IEC 50(705)-02-01]

06.01.104
radiation efficiency
ratio of the total power radiated by an antenna to the net power accepted by the antenna

[IEC 50(712) 712-02-50]

antenna efficiency (for an aperture-type antenna) For an aperture-type antenna with a specified aperture illumination, the ratio of the maximum total effective area to the geometric area of the aperture.

[IEC 50(712) 712-05-06]

06.01.105
radiation pattern
radiation diagram
graphical representation of the distribution in space of a quantity which characterizes the electromagnetic field produced by an antenna

NOTE For example, a radiation pattern may be a plot of the magnitude of a far field component, or alternatively contours of equal value of a far field component, at a given distance from the antenna, as a function of the direction.

[IEC 50(712) 712-02-15]

06.01.106
range
distance (minimum and maximum) between interrogator antenna and tag(s)

NOTE For multiple tags, the range will be measured to the geometric centroid of the tag population.

06.01.107
read/write
ability to both read data from a **transponder** and to change data (**write** process) using a suitable **programming** device

cf. reader/interrogator

06.01.108
receiving signal strength indicator
RSSI
value of the received input power, which can be represented as **digital** data or analog voltage depending on the hardware implementation

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06.01.109
screening
process of masking **RF** transmissions to avoid unwanted operation of **tags** outside the desired field of view

NOTE The process of avoiding or minimizing electromagnetic **interference** by use of electromagnetic reflective and absorptive materials suitably structured or positioned to reduce interaction between the source of potential **interference** and the circuit being protected.

06.01.110
signal element
part of a discretely timed signal distinguished from the others by one or more characteristics such as its duration, its relative position, its waveform, its magnitude

[IEC 60050-702 702-05-01]

NOTE Each of the parts constituting a discrete signal and distinguished from the others by one or more characteristic quantities.

NOTE Examples of characteristic quantities are amplitude, waveform, duration, and position in time.

[ISO/ICE 2382-9 09.02.05]

06.01.111
signal to noise & distortion
SINAD
abbreviation for signal-plus-noise-plus-distortion to noise-plus-distortion ratio, usually expressed in decibels (dB)

NOTE SINAD is calculated as the ratio of (a) total received power, i.e., the received signal-plus-noise-plus-distortion power to (b) the received noise-plus-distortion power.signal-to-noise ratio

06.01.112
signal/noise ratio
S/N
ratio, generally expressed in decibels, of the power of wanted signal to that of the coexistent noise at a specified point in a transmission channel, usually at the receiver output, under specified conditions

NOTE 1 The signal cannot generally be separated from noise, and in practice the ratio (signal noise) to noise is measured.

NOTE 2 The specified conditions comprise among others, the nature and characteristics of the wanted signal, the nature and characteristics of the noise, the receiver and antenna characteristics such as the bandwidth.

[ICE 60050-713:1998 713-11-19]

06.01.113
sinusoidal carrier
fundamental waveform, characterized by a single frequency and wavelength, used to carry data or information by modulating some feature of the waveform

cf. modulation

06.01.114
spectrum-mask
maximum power density of a transmission expressed as a function of frequency

06.01.115
time division duplexing
TDD
specifies the procedure how the physical time is handled

Example interrogator and tag are not operated at the same time

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06.01.116
time division multiplexing
TDM
multiplexing in which several independent signals are allocated separate periodic time intervals for transmission over a common channel

[IEC 60050-704 704-08-07]

06.01.117
up-link
radio link between a transmitting earth station and receiving space station

[IEC 60050-725 725-12-23]

06.01.118
transmission channel
means of transmission of signals in one direction between two points

NOTE Several channels may share a common path: for example, where each channel is allocated a particular frequency band or a particular time-slot. In some countries, the term “communication channel” or its abbreviation **“channel”** is also used to mean “telecommunication circuit”, i.e. to encompass the two directions of transmission. This usage is deprecated. A transmission channel may be qualified by the nature of the transmitted signals, or its bandwidth or its digit rate: for example: telephone cannel, telegraph channel, data channel. 10 MHz channel. 34 Mbit\s channel.

[IEC 60050-704 704-04-02]

06.01.119
open field
path from transmitter to receiver is LOS (Line Of Sight)

06.01.120
operating environment
region within which an interrogator’s RF transmissions are attenuated by less than 90dB

NOTE In free space, the operating environment is a sphere whose radius is approximately 1000m, with the interrogator located at the centre; in a building or other enclosure, the size and shape of the operating environment depends on factors such as the material properties and shape of the building, and may be less than 1000m in certain directions and greater than 1000m in other directions

06.01.121
operating procedure
set of functions and commands used by an interrogator to identify and modify tags (also known as the tag-identification layer)

06.01.122
session
inventory process comprised of an interrogator and an associated tag population

Example an interrogator chooses one of four sessions and inventories tags within that session; the interrogator and associated tag population operate in one and only one session for the duration of an inventory round (defined above); for each session, tags maintain a corresponding inventoried flag; sessions allow tags to keep track of their inventoried status separately for each of four possible time-interleaved inventory processes, using an independent inventoried flag for each process

06.01.123
command set
set of commands used to explore and modify a tag population

06.01.124
automatic repeat request
ARQ
protocol consisting of error detection and following repetition of the transmission for correcting if necessary

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NOTE The frequency used to carry data by appropriate modulation of the carrier waveform, typically in a radio frequency identification system by amplitude shift keying (ASK), frequency shift keying (FSK), phase shift keying (PSK) or associated variants. A carrier signal does not convey any information until the data is added to the signal by modulation.

06.01.125
compatibility
suitability of products, processes or services for use together under specific conditions to fulfill relevant requirements without causing unacceptable interactions

NOTE Interchangeability, interoperability, and non-interference are differing levels (or degrees) of compatibility.

06.01.126
frequency range (of an equipment)
set of frequencies over which equipment can be adjusted to operate satisfactorily

NOTE The frequency range of equipment can be subdivided into switched sub-ranges which may or may not be contiguous. [IEC 60050-702 702-09-68]

06.01.127
interchangeability
condition that exists between devices or systems that exhibit equivalent functionality, interface features and performance to allow one to be exchanged for another, without alteration, and achieve the same operational service

06.01.128
SRD
short range device
radio Transmitters which will provide both unidirectional or bi-directional communication and which have low capability of causing interference to other radio equipment

NOTE The following categories are amongst those covered as an SRD:

- telecommand and telecontrol
- telemetry
- alarms
- speech and video

06.01.129
technical basis for regulation
TBR
subset of **ETSs** (specifications and tests) developed by ETSI, which serve as the basis for the common technical regulations (CTR)

06.01.130
chip
in digital radio communications, the time part of the signal which represents one character, transmitted with characteristics which are distinct from those of the other parts of the same signal, in accordance with a specified rule

NOTE - Adapted from [IEC 60050-713 713-07-04]

06.01.131
capture field/area/zone
region of the **electromagnetic field,** determined by the **reader/interrogator antenna,** in which the **transponders** are signalled to deliver a response

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06.01.132
anti-clash
term describing a facility for avoiding contention at the **reader/interrogator** receiver for responses arising from **transponders** simultaneously present within the read or **interrogation zone** of a **radio frequency identification** system and competing for attention at the same time without producing an error report or blocking transaction

NOTE also referred to as anti-contention and anti-collision

06.01.133
field of view
FoV
capture field/area/zone
zone surrounding a reader/interrogator in which the reader/interrogator is capable of communicating with a transponder

06.01.134
forward link
communications from **reader/interrogator** to **transponder** alternatively known as **downlink**

cf. compare uplink

06.04.01
antenna
aerial (deprecated)
part of a radio transmitting or receiving system which is designed to provide the required coupling between a transmitter or a receiver and the medium in which radio wave propagates

[IEC 50 (712) 712-01-01]

NOTE 1 Antenna structures, often encountered in **radio frequency identification** systems, may be used to both transmit and receive electromagnetic energy, particularly data modulated electromagnetic energy

NOTE 2 See also **dipole**

06.04.02
dipole antenna
symmetrical antenna composed of conductors usually rectilinear and energized by a balanced feed

NOTE 1 The word “dipole” is sometimes used to describe antennas which do not conform in all respects to the above definition. In such cases, the word should be qualified, for example: “asymmetrical dipole”

[IEC 50 (712)-712-04-23]

NOTE 2 Dipole antennas comprising a single conductor of length approximately equal to half the wavelength of the **carrier** wave.

NOTE 3 Dipole antennas provide the basis for a range of other more complex forms of **antenna**

06.04.03
exciter
electronic circuits used to drive an antenna

NOTE The combination of exciter and antenna is often referred to as the transmitter or scanner.

06.04.04
memory card(1)
read/write or re-programmable **tag** credit card sized

NOTE Data may be accessed via direct contact, through a microprocessor (smart card) or via a radio link (non-contact)

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06.04.05
memory card(2)
deprecated synonym for flash memory card

[IEC 60050-713:1998 713-06-03]

06.04.06
transponder
combination of radio transmitter and radio receiver, which transmits a signal automatically in response to an appropriate triggering signal

NOTE The signal transmitted in response is in part predetermined and is generally different from the response to an appropriate triggering signal.

[IEC 60050-713 713-08-04]

06.04.07
on-board equipment
OBE
on-board transponders
transponders fitted to a vehicle or item to be identified and containing the unique or unambiguous positive identification and associated data

06.04.08
planar array
flat panel antenna
array in which corresponding points of the radiating elements lie in a plane

[IEC 50(712) 712-01-07]

NOTE May be characterized as flat, conductive sheet **antennas**, usually made of metal plate or foil.

06.04.09
programmer
electronic device for entering or changing programming data in a **transponder**, usually via a close **proximity**, inductively coupled data transfer link

06.04.10
sensor
electronic device that senses a physical condition or chemical compound and delivers an electronic signal proportional to the observed characteristic

06.04.11
transceiver
transmitter-receiver
combination in a single unit of a radio transmitter and radio receiver employing common circuit components and usually the same antenna for both transmitting and receiving

[IEC 60050-713:1998 713-08-02]

06.04.12
transmitter
electronic device for creating an **electromagnetic wave** and delivering an **electromagnetic field** via an antenna for the purpose of transmitting energy and/or communicating by a modulated data information to a tag

NOTE Often considered separately from the **antenna**, as the means whereby the antenna is energized. In this respect it is also referred to as an exciter.

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06.04.13
surface acoustic wave
SAW
technology used for automatic identification in which low power microwave **radio frequency** signals are converted to ultrasonic acoustic signals by a piezoelectric crystalline material in the **tag**

NOTE Variations in phase shift in the reflected signal can be used to provide a unique identity.

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Information technology – AIDC techniques – Harmonized vocabulary, Abbreviations

OBE		On-board equipment
TBR		Technical basis for regulation
SRD		Short range device
PWM		Pulse width modulation
PDM		Pulse duration modulation
PSK		Pulse shift keying
MSK		Minimum shift keying
GSMK		Gaussian minimum shift keying
FSK		Frequency shift keying
FHSS		Frequency Hopping Spread Spectrum modulation
DSSS		direct sequence spread spectrum modulation
DBPSK		differential binary phase shift keying
BPSK		binary phase shift keying
ARQ		automatic repeat request
ASK		amplitude shift keying
TDM		time division multiplexing
TDD		time division duplexing
S/N		signal/noise ratio
SINAD		signal to noise & distortion
RSSI		receiving signal strength indicator
RFI		radio-frequency interference
RF/DC		radio frequency data communication
PPM		pulse position modulation
PM		phase modulation
MHz		Megahertz
kHz		kilohertz
GHz		gigahertz
ETSI		European Telecommunications Standards Institute
ETS		European Telecommunications Standard
ETR		European Telecommunications Report
EIRP		Effective Radiated Power
EMI		electromagnetic interference
CDMA		code division multiple access(2)
CSMA/CD		Carrier Sense Multiple Access with Collision Detection
CSMA		Carrier Sense Multiple Access(2)
SAW		Surface acoustical wave

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Information technology AIDC techniques - Harmonized vocabulary, Part 5 – Locating systems

Techniques automatiques de la saisie d'identification et de données (AIDC)— Vocabulaire harmonisé — Partie 5: Localiser des systèmes

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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.

ISO/IEC 19762 was prepared by ISO/IEC JTC 1/SC 31 – Automatic Identification and Data Capture Techniques, Vocabulary Rapporteur.

ISO/IEC 19762 consists of the following parts, under the general title *Information technology AIDC techniques - Harmonized vocabulary*:

Part 1: Information technology, AIDC techniques - Harmonized vocabulary - General terms relating to Automatic Identification and Data Capture (AIDC)

Part 2: Information technology, AIDC techniques - Harmonized vocabulary - Optically Readable Media (ORM)

Part 3: Information technology, AIDC techniques - Harmonized vocabulary - Radio-Frequency Identification (RFID)

Part 4: Information technology, AIDC techniques - Harmonized vocabulary – General terms relating to radio communications

Part 5: Information technology, AIDC techniques - Harmonized vocabulary – Locating systems

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Introduction

ISO/IEC 19762 is intended to facilitate international communication in information technology, specifically in the area of automatic identification and data capture (AIDC) techniques. It provides a listing of terms and definitions used across multiple AIDC techniques. Abbreviations used within each part of ISO/IEC 19762 and an index of all definitions used within each part of ISO/IEC 19762 are found following the end of each document.

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Information technology – AIDC Techniques – Harmonized vocabulary, Part 5 – Locating systems

Scope

This part of ISO/IEC 19762 provides general terms and definitions in the area of automatic identification and data capture techniques on which are based further specialized sections in various technical fields, as well as the essential terms which should be used by non-specialist users in communication with specialists in automatic identification and data capture techniques.

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 19762-1, *Information technology AIDC techniques - Harmonized vocabulary, Part 1 - General terms relating to Automatic Identification and Data Capture (AIDC)*

ISO/IEC 19762-2, *Information technology AIDC techniques - Harmonized vocabulary, Part 2 - Optically Readable Media* (ORM)

ISO/IEC 19762-3, *Information technology AIDC techniques - Harmonized vocabulary, Part 3 – Radio-Frequency Identification (RFID)*

ISO/IEC 19762-4, *Information technology AIDC techniques - Harmonized vocabulary, Part 4 – General terms relating to radio communications*

Classification of entries

The numbering system employed within ISO 19762 is in the format nn.nn.nnn, in which the first two numbers (***nn***.nn.nnn) represent the “Top Level” reflecting whether the term is related to 01 = Common to All AIDC Techniques, 02 = Common to All Optically Readable Media, 03 = Linear Bar Code Symbols, 04 = Two-dimensional Symbols, 05 = General terms radio, 06 = Radio Frequency Identification, 07 = Real Time Locating Systems, and 08 = MIIM. The second two numbers (nn.***nn***.nnn) represent the “Mid Level” reflecting whether the term is related to 01 = Basic Concepts/Data, 02 = Technical Features, 03 Symbology, 04 = Hardware, and 05 = Applications. The third two or three numbers (nn.nn.***nnn***) represent the “Fine” reflecting a sequence of terms.

The numbering in this part of ISO/IEC 19762 employs “Top Level” numbers (**nn**.nn.nnn) of 07

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Terms and definitions

07.01.01
real time locating system
RTLS
combination of hardware and software that is used to continuously determine and provide the real time position of assets and resources equipped with devices designed to operate with the system

07.01.02
geolocation
latitude and longitude coordinates of a particular location

07.01.03
homing
ability to locate/find a specific **transponder** with or without a portable **interrogator**

07.01.04
event blink
EB
one or more redundant emissions from an RTLS transmitter that is caused by an external input such as a switch or serial connection

07.01.05
exciter blink
EXB
one or more redundant emissions from an RTLS transmitter that is caused by entering the electromagnetic field of a device intended to trigger a transmission

07.01.06
sub-blink
message that is transmitted one or multiple times in a "blink"

07.01.07
tag blink
radio frequency transmission(s) from an RTLS transmitter that may consist of one or multiple duplicate messages (sub-blinks)

07.01.08
timed interval blink
TIB
one or more redundant emissions from an RTLS transmitter that is used for location calculation and is emitted at a regular rate which is pre-programmed into the RTLS transmitter

07.01.09
infrastructure(RTLS)
system components existing between the air interface protocol and the RTLS server API

07.04.01
exciter(RTLS)
device that transmits a signal that alters the behavior of an RTLS transmitter

07.04.02
reader(RTLS)
device that receives signals from an RTLS transmitters

07.04.03
server(RTLS)
computing device that aggregates data from the readers and determines location of transmitters

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07.04.04
transmitter(RTLS)
active radio devices that utilize the specified RTLS protocols

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Information technology – AIDC techniques – Harmonized vocabulary, Abbreviations

EB		event blink
EXB		exciter blink
RTLS		real time locating system
TIB		timed interval blink

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Information technology – AIDC techniques – Harmonized vocabulary, Index

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