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Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary —

Part 1: General terms relating to AIDC

Technologies de l'information — Techniques automatiques d'identification et de saisie de données (AIDC) — Vocabulaire harmonisé —

Partie 1: Termes généraux relatifs à l'AIDC

Reference number
ISO/IEC 19762-1:2008(E)

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Foreword

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

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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ISO/IEC 19762-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 19762-1:2005), which has been technically revised.

ISO/IEC 19762 consists of the following parts, under the general title *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*:

— *Part 1: General terms relating to AIDC*

— *Part 2: Optically readable media (ORM)*

— *Part 3: Radio frequency identification (RFID)*

— *Part 4: General terms relating to radio communications*

— *Part 5: 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 at the end of the relevant part.

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Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary —

Part 1:
General terms relating to AIDC

1 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 to be used by non-specialist users in communication with specialists in automatic identification and data capture techniques.

2 Classification of entries

The numbering system employed within ISO/IEC 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 = radio frequency identification, 06 = general terms relating to radio, 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.

3 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.

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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.

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.

01.01.09
hexadecimal, 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'.

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01.01.10
hexadecimal, 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

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

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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 that usually comprises 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.

[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 a **data** 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

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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(2)**

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 as few code words as possible

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)
⟨**information theory**; **communication theory**⟩ ordered sequence of characters intended to convey information

01.01.37
record
⟨organization of **data**⟩ 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
⟨hypermedia⟩ language element in a mark-up language used for structuring data text, or objects

EXAMPLES start-tags and end-tags

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

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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 examples used in automatic **data** capture include ISO/IEC 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.

[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
See **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).

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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

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

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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 relies on the fact that each instance of its object is unique and unambiguous with all other 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.

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]

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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

NOTE Bar code, OCR character string and RF tag are examples of data carriers.

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

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(1)
request to extract **data** directly or to derive them from a **data**base, based on specified conditions

NOTE A request to a reservation system for availability of a seat on a specific flight is an example of a query.

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.

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01.01.78
selection
⟨database⟩ 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 that provides responses to requests from other software programs, which are frequently on other remotely connected computers

01.01.80
software
⟨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
⟨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]

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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** in ISO/IEC 19762-2

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

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

NOTE Contact: ANSI, 25 West 43rd Street, 4th floor, New York, NY 10036, USA. 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

NOTE Contact: Michael Ogle, Director of Technical and Engineering Svcs., 8720 Red Oak Blvd., Suite 201 Charlotte, NC 28217, Tel: +1 704/676-1190, Fax: +1 704/676-1199, http://www.autoid.org/ANSI_MH10/Default.htm

01.01.93
INCITS
International Committee for Information Technology Standards
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/IEC 15418 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/IEC 15418 and ANS MH10.8.2.

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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

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)
〈**data** communications〉 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

NOTE 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

cf. **full-duplex transmission**

NOTE 1 Adapted from ISO/IEC 2382-9:1995, 09.03.06.

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

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01.02.10
query(2)
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.

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
⟨local area network⟩ protocol that governs the exchange of **frames** between **data** stations independently of how the transmission medium is shared

01.02.14
spectrum
⟨signal or noise⟩ 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
⟨optically readable media⟩ one of the three angles characterizing the angular rotation of a symbol in an axis relative to a scan line

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01.02.20
reflectance factor
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 60050-845, 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.

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

01.02.22
authentication
〈security〉 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” and ”multiplex”.

[IEC 60050-704, 704-08-01]

NOTE 2 A **data** multiplexer is 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]

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01.02.27
frame(2)
transmission frame
⟨**data** communications⟩ **data** structure that consists of fields, predetermined by a protocol, for the transmission of user **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)
encipherment
cryptographic transformation of **data**

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)
⟨**data** communications⟩ 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

cf. **symbol check character** in ISO/IEC 19762-2

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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]

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

NOTE A write-enable ring for a magnetic tape, a write-protect notch on a diskette, and an entry in the file access table to indicate that a file cannot be deleted are examples of write protection.

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

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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
⟨functional unit⟩ 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)
⟨**digital data**⟩ 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

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

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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**, in which a logical “1” has a transition in the middle of the bit period, and a logical “0” has no transition, unless followed by another zero

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

01.03.07
differential encoding(1)
See **non-return to zero-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
See **non-return to zero-Invert on ones**

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

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01.03.12
non-return to zero-Invert on ones
NRZ-I
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.

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)
⟨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 **multiplexers**, concentrators usually have a buffering capability to ‘queue’ inputs that would otherwise exceed transmission capacity

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01.04.02
concentrator(2)
〈**data** communications〉 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

01.04.03
controller
See **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

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

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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)
⟨network⟩ 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.

01.04.15
node(3)
⟨**data** structure⟩ 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
⟨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)
⟨micrographics⟩ device that enlarges micro images for viewing

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

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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 9 600 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 3 000 m

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 1 000 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/IEC 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.

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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

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
transport package or unit load

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01.05.06
freight containers
article of transport equipment with the following properties:

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

e) an internal volume of 1 m^3 (35.3 ft^3) 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

[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

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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

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

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

01.05.23
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**

01.05.24
extended channel model
system for encoding and transmitting both data message bytes and control information about the message within which a decoder operates in extended channel mode

NOTE The control information is communicated using **extended channel interpretation (ECI)** escape sequences.

4 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	extended channel interpretation
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 control
LSB	least significant bit

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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 to zero
NRZ Space	non-return to zero-space
NRZ-I	non-return to zero-Invert on ones
NRZ-M	non-return to zero-Invert on ones
RTI	returnable transport item
RZ	return to zero
VLD	visible laser diode

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