

The CiA house style specifies the language, formatting, and presentation of CiA specifications and CiA technical reports. It is also partly applicable to CiA publications such as CAN Newsletter articles, CiA press releases, and contributions to social media.

When drafting CiA technical documents, the primary reference is the ISO/IEC Directives, Part 2<sup>1</sup>, which states the general principles and rules to follow in order to ensure that CiA documents are clear, precise, and unambiguous.

CiA aims to deliver high-quality documents when and where the market needs them, both in terms of technical content and ease of use. CiA technical documents are used worldwide. Consistency in writing style and tone, and in document look and feel, allows the user to easily recognize a CiA technical document, to know how to use it, and to have confidence in the quality of its contents. It also enables documents to be published more efficiently.

## **Spelling and wording**

CiA documents use American English spelling.

## **Plain English**

Use plain English to explain the subject of a document as simply and effectively as possible. Plain English is easier to read, which results in less misunderstanding and misapplication of instructions.

CiA documents have international users who often read in their non-native language. Clear and concise writing avoids errors in translation. Plain English is not unprofessional or informal; it is a tool of good communication.

- Write in short sentences and paragraphs to break up the text and make it easier to follow. A sentence should contain only one idea. A sentence should not contain more than 20 words. A page should contain several short paragraphs.

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<sup>1</sup> <https://www.iso.org/sites/directives/current/part2/index.xhtml>

- Use frequent sub-clause headings and lists to split up concepts, processes, and methods into smaller pieces. If a list is very long or has complex subdivision, try to break it into several shorter lists.
- Use tables and figures to illustrate anything that is difficult to explain in words. Avoid very complicated tables and figures. Try to use several shorter tables that can each fit onto one page and use sub-figures for the individual components of a complex figure.
- Use lots of punctuation. For example, a comma creates a pause in a sentence that helps the user to follow the flow of your words.
- Use ISO-conformant verbal forms to easily identify requirements (shall), recommendations (should), permissions (may), possibility and capability (can) and external constraints (must) in the text. Alternative expressions are not always easily understood in place of the ISO-conformant verbal forms. For details see ISO/IEC Directives, Part 2.
- Every technical sector uses specific terminology (i.e. jargon) and it is appropriate to use technical language in CiA documents. However, it can be helpful to provide a simple explanation for technical terms. Use plain English to write the definition of these terms in Clause 3 of CiA documents. Do not assume that all users will have the same level of understanding as the members of a CiA special interest group (SIG) or CiA interest group (IG).
- Give instructions using direct, active verbs. For example, the following instruction is clearer in the second version:
  - “Each test sample obtained in accordance with A.4.1 shall be weighed to the nearest 0,1 g and the different defects shall be separated into the bowls.”
  - “Weigh, to the nearest 0,1 g, each of the test samples obtained in accordance with A.4.1. Separate the different defects into the bowls.”
- Use the present tense by default. Only use past or future tenses when specifying something that happened in the past or will happen in the future.
- Use an impersonal tone. Avoid “I”, “we”, “you” and other personal pronouns.

## Inclusive language

CiA is committed to use inclusive language in its specifications and technical reports. Table 1 provides the often-used inclusive terms and the terms they substitute in the CAN application field.

*Table 1 — Inclusive terms and non-inclusive terms in the CAN application field*

Non-inclusive terms	Inclusive terms
application master	application manager
flying (NMT) master	flying (NMT) manager
LSS master/LSS slave	LSS manager/LSS server

<b>Non-inclusive terms</b>	<b>Inclusive terms</b>
NMT master/NMT slave	NMT manager/NMT server

Avoid terminology related to race. Substitute “master” and “slave” by other terms such as “controller/device”, “producer/consumer”, or “commander” and “responder”. Instead of describing lists as “black and white”, use “block and allow” lists, for example.

The terms “male and female” are sometimes used to describe electronic and mechanical connectors or fasteners. These terms can be substituted with, for example, “convex”, “plug”, “pin” or “prong” as opposed to “concave”, “receptacle”, “socket” or “slot”.

### **Use inclusive language all over the documents**

Table 2 provides some examples of gender-neutral expression.

Use “she or he”, “him or her” and “his or her” or, for example, “the operator” or “the manufacturer” when referring to an individual. Alternatively, “they”, “them”, and “their” can be used as singular or plural.

Avoid using words that are unnecessarily gender specific. For example, write: “The material was synthetic” rather than “The material was man-made”.

Avoid stereotyped assumptions about the roles of men and women or people of different ages and backgrounds. For example, do not assume that a construction worker is a man or that an older person does not possess skills in using modern technology. When writing about groups of people, use language that highlights that they are individual people with X characteristics in common rather than a group defined only by that characteristic. For example, write “people with a visual impairment” rather than “the blind and partially sighted”.

*Table 2 — Examples of gender-neutral expression*

<b>Traditional (gendered)</b>	<b>Alternative (gender-neutral)</b>
businessman	business manager; executive; agent; representative (plural: business people; business community)
chairman	chair or chairperson
craftsman	artisan; craftworker
foreman	supervisor
man	person or individual
man a project	staff a project; hire personnel; employ staff

<b>Traditional (gendered)</b>	<b>Alternative (gender-neutral)</b>
man-made	artificial; synthetic; manufactured; industrial; [relevant verb, e.g. made, created, caused] by human beings
mankind	people, humanity; human beings; the human race; men and women; homo sapiens; the public; society
manpower	staff; labor; workforce; personnel; workers; human resources
middleman	go-between, intermediary
mother tongue	first language; native language
policeman/men	police officer (plural: police)
spokesman	spokesperson; spokesman or woman (for specific person)
the common man	the average or ordinary person

## Grammar

Grammar is everything known about the structure of a language. It is a big topic beyond the scope of any style guide. However, here are answers to some common questions.

### Agreement of the verb with the subject

In any clause of a sentence, the verb must agree with its subject in terms of singular or plural. For example:

- “The method is used”: singular subject with singular verb.
- “The methods are used”: plural subject with plural verb.
- “Method A and procedure B are used”: two singular subjects with plural verb.

For singular collective nouns (nouns that refer to a group of individuals, e.g. organization, top management, government, committee), the subject can be treated as either singular or plural depending on whether the group is described as a single, impersonal entity or as a collection of individual members. For example:

- “The committee was elected in March”: refers to the committee as a single entity.
- “The committee were in heated debate”: refers to the actions of the individual members of the committee.

When the collective noun is followed by a non-defining relative clause, use the relative pronoun “which” for a singular subject and “who” for a plural subject:

- “The team, which is based in Geneva, comprises five people.”

- “The team, who are currently revising the document, will report back shortly.”

### **Defining and non-defining relative clauses (i.e. using “that” or “which”)**

A relative clause is the part of a sentence used to describe a noun. It comes immediately after the noun it describes. There are two types of relative clauses:

- A defining clause identifies who or what is being discussed. It cannot be omitted without affecting the meaning of the sentence. It is not enclosed with commas.
  - “The documents that were approved were submitted for the next stage.”
- A non-defining clause adds information to the sentence and can be omitted without changing the meaning. It is enclosed with commas.
  - “The documents, which were approved, were submitted for the next stage.”

In the first example sentence, the only documents submitted were those that were approved. There are other (non-approved) documents that were not submitted. The relative clause (“that were approved”) defines which documents were submitted. Removing it would change the meaning of the sentence.

In the second example sentence, all the documents were submitted and the relative clause (“, which were approved,”) merely provides additional information. If it was removed, the sentence would retain its meaning.

Either “that” or “which” can be used to introduce a defining clause. However, “which” is always used to introduce a non-defining clause.

### **A or an**

The choice depends on the sound of what follows:

- “a” is used before a word or abbreviated term beginning with a consonant sound, e.g. a bank, a European, a hospital, a hotel, a one-term appointment, a user.
- “an” is used before a word or abbreviated term beginning with a vowel sound, e.g. an organization, an MSS [“em-s-s”], or an “h” if the “h” is silent, e.g. an hour.

### **Affect or effect**

Affect (verb) means to have an influence on, e.g. “The use of method A affects the result”.

Effect (verb) means to cause or to accomplish, e.g. “The use of method A effects a change in the system”.

## Assure or ensure

Assure (verb) means to remove someone's doubts, e.g. "When a customer wants to be assured that the quality of a lot conforms to the quality specified, sampling should be carried out in accordance with CiA 123".

Ensure (verb) means to make sure of something, e.g. "The CiA interest group defines its method to ensure the CiA specification is suitable for the intended use".

## Compare to or compare with

Use "compare to" to emphasize a similarity between two subjects.

Use "compare with" to contrast two subjects in order to identify a difference. In this example, it is anticipated that there will be differences in the results that the user should pay attention to:

- "Compare the results of sample 1 with those of sample 2."

## Fewer or less

Use "fewer" for things you can count and use "less" for things you cannot count, e.g. fewer test samples but less test equipment, fewer days but less time.

## It's and other contractions

Contractions such as it's, they'll and they'd create an informal tone and are not appropriate for CiA documents. Use the full forms instead.

## Respectively

"Respectively" is an adverb that is often misused. It means "in the order given" and is only used if the sentence would be unclear without it. For example:

- "Samples 1 and 2 shall contain 100 ml and 50 ml of ethanol, respectively."

In this case, "respectively" is used to attribute each of the two values individually to the two samples in the order in which they appear, i.e. sample 1: 100 ml, sample 2: 50 ml.

## Foreign spelling

Follow the spelling of proper nouns and words from foreign languages, including accented letters, cedillas, ligatures, or other special marks and any alphabetical forms that do not normally occur in English.

Reproduce the names of foreign companies as used by the company itself, with all the appropriate characters (French accents, Spanish tildes, etc.), e.g. Crédit Agricole, Compañía Española de Petróleos S.A., Polmos Żyrardów.

These characters are also used in headings and on capital letters.

## Latin and Greek wording

Avoid the use of Latin words as far as possible. Use plain English instead.

Do not italicize commonly used Latin expressions, e.g. a priori, in situ, in vitro.

Italicize Latin words used for scientific terms, e.g. species, bacteria, plants. For example, “This document describes a horizontal method for the detection of *Salmonella* spp. in food”.

Many nouns (particularly from Latin) retain their original plurals; others have taken on the anglicized “s” ending. In some cases, both forms are still used.

For Latin and Greek words, use the English plural if one exists, e.g. forums, stadiums, statuses. Otherwise, use the appropriate foreign plural forms that are still commonly used.

- addendum – addenda
- analysis – analyses
- axis – axes
- basis – bases
- corrigendum – corrigenda
- crisis – crises
- criterion – criteria
- curriculum – curricula
- datum – data\*
- genus – genera
- medium – media
- memorandum – memoranda
- millennium – millennia
- nucleus – nuclea
- phenomenon – phenomena
- series – series
- species – species
- spectrum – spectra
- stratum – strata

\*Data is the plural of the Latin word datum. In modern English usage, it is often treated as a mass noun with a singular verb. CiA style is to use the plural form: “The data are clear”.

In some cases, the choice of plural depends on the context of the sentence:

- antenna – antennae (insects), but antennas (aerial)
- appendix – appendices (in books), but appendixes (anatomy)
- formula – formulae (maths), but formulas (general)
- index – indices (maths), but indexes (in books)

## **Names of countries, territories, and currencies**

Codes for countries, dependencies, other areas of particular geopolitical interest and their subdivisions are specified by ISO 3166 (parts 1, 2, 3) and are available on the Online Browsing Platform<sup>2</sup>. Select “country codes” and “search” to see the full list.

For example, use:

- The Democratic People's Republic of Korea (DPRK) and not North Korea;
- The Republic of Korea (ROK) and not South Korea;
- The Russian Federation and not Russia;
- Viet Nam and not Vietnam.

As exceptions it is permitted to use:

- The United Kingdom (UK) and not the United Kingdom of Great Britain and Northern Ireland;
- The United States (US) and not the United States of America (USA).

Codes for countries' currencies are specified by ISO 4217 and are available to from the ISO 4217 Maintenance Agency<sup>3</sup>.

## **IT terms**

Refer to “the internet” (in lower case) and not to “the Web”.

Use “online” and not “on-line”.

Avoid using capitals for IT terms.

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<sup>2</sup> <https://www.iso.org/obp>

<sup>3</sup> <https://www.currency-iso.org/en/home/tables/table-a1.html>

## Conformity and conformity-related terms

The word “compliance” is used in connection with legislation and regulations, which are not generally mentioned in CiA documents.

Use the word “conformity” when referring to requirements. The phrase “in accordance with” can also be used for expressing conformity-related requirements.

## Legal statements

Do not include legal, regulatory, or statutory requirements or recommendations.

It is permitted to refer factually to the law and regulations to explain how they relate to the subject of the document.

When referring to the law, use clear language so the user understands the meaning. For example, write “legal requirements” not “jurisdictional regulations”.

## Formula(e)

In CiA documents, the words “formula” (singular) and “formulae” (plural) are used when referring to all types of equations, relations, inequalities, expressions, and other mathematical forms.

## Informative and normative labels

Use the label “(informative)” or “(normative)” under an annex title to indicate how the annex has been referenced in the text. Remember that informative annexes can contain requirements that apply if the user chooses to implement the annex.

## Clause 2 is always called "Normative references".

Do not label any other titles of elements of the document (clauses, sub-clauses, tables, figures, etc.) as either informative or normative. Do not use the words “informative” or “normative” for cross-references in the text. For example, write: “The object shall be registered in accordance with Annex A” and not “The object shall be registered in accordance with normative Annex A” (it is the “shall” that makes the annex normative).

Unless there is a clear requirement (“shall”) or imperative language in the text, all document content is informative by default.

## Might and could

ISO/IEC Directives, Part 2 explains the verbal forms to be used in CiA documents to express requirements, recommendations, permissions, possibilities and capabilities, and external constraints.

In the English language, the words “may”, “can”, “might”, and “could” are often used interchangeably. The subtle differences in meaning are not easily translated into other languages when CiA documents are used around the world.

To ensure that a document is understood and applied correctly, use “may” to express a permission and “can” to express a possibility or a capability. Avoid substituting either of these terms with “might” or “could”, even if this seems logical in English. Revise a sentence that uses “might” or “could” to avoid confusion and misapplication of the text.

### **Interlaboratory or intralaboratory**

An “interlaboratory” comparison involves testing the same or similar samples, using the proposed or existing method, in different laboratories and comparing the results. Do not use the term "round robin" instead of "interlaboratory".

Reproducibility (R) is obtained from the interlaboratory comparison.

An “intralaboratory” comparison involves testing samples, under the same conditions, within a single laboratory to ensure the reliability of test results produced by the laboratory.

Repeatability (r) is obtained from the intralaboratory comparison.

### **In accordance with or according to**

Use “in accordance with” with “shall” or the imperative form to express a requirement, e.g. specifying a test method or a reference document to use for conformity: “The method shall be validated in accordance with CiA 123”.

Use “according to” as an informative statement, e.g. for providing the source of a quotation: “according to Reference [4]”.

### **Capitals**

Use capitals sparingly. The use of many capitals makes a page look bureaucratic or pretentious, especially when ordinary words such as method or framework are unnecessarily capitalized.

Proper nouns are always capitalized, e.g. Hamming distance.

Otherwise, nouns are given in lower case, i.e. words such as committee, organization, report, government only have a capital when part of a full title, e.g. the CiA Business Committee.

If the full form of an abbreviated term is not a proper noun, the abbreviated term is generally presented in capital letters, e.g. NMT (network management), but the full written form is not given initial capital letters, e.g. network management and not Network Management.

Capital letters are used when referring to a “Public Available Specification” and to the elements of a document, e.g. Introduction, Scope, Bibliography, “see Clause 6”, “an example can be found in Annex B”.

## **Abbreviated terms, abbreviations, and contractions**

CiA documents use the wording “abbreviated terms” to refer to both acronyms and initialisms. They are formed from the initial letters of other words.

NOTE Acronyms are strings of initial letters pronounced as a word (CEN, UNESCO). Initialisms are not pronounced as a word (IEC, USA).

Do not use the term “abbreviations” in this context because this refers instead to shortened words.

The instructions on presenting abbreviated terms as given ISO/IEC Directives, Part 2 apply also for CiA documents:

- "The use of abbreviated terms shall be consistent throughout the document. If a list of abbreviated terms is not given in the document (see Clause 17), then the first time that an abbreviated term is used, the full term shall be given with the abbreviated term following in brackets.

EXAMPLE “the weighted root mean square (RMS) width of the active output interface optical spectrum ...”

Exceptions may be made when the abbreviated term is so familiar that it is used more often than the full form, e.g. AEF, IEEE, SAE, and when in addition the full form does not provide extra clarity, e.g. EEPROM, ID, PDO, PGN.

If a list of abbreviated terms is given, it is not necessary to spell out the full term at the first use (but it is allowed).

There is no need to give the abbreviated form of a term if it is not referred to again.

Avoid repeatedly spelling out abbreviated terms, except when the abbreviated term is used in both the document Title and Scope, in terms and definitions, and in clause/sub-clause headings.

In terms and definitions, the full term is spelled out at the first use in each entry. This is because terms and definitions are available as standalone items on the CiA glossary of terms<sup>4</sup>.

In clause/sub-clause headings, using the full term rather than the abbreviated form can lead to overly long or complex headings. Either form can be used providing its use is consistent.

As specified in ISO/IEC Directives, Part 2: "Any abbreviated term should be in upper case letters, without a full stop after each letter."

EXAMPLE “PDO” for “process data object”

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<sup>4</sup> <https://www.can-cia.org/groups/cia-glossary-of-terms/>

If the abbreviated term can be pronounced (e.g. CEN, ISO), it does not generally require the definite article (“the”). Otherwise, it is preceded by an article (e.g. a GPS, the UN, a URN, the WHO).

The plural form of an abbreviated term generally uses a lower-case “s”, e.g. for process data object (PDO): “The PDOs can be transmitted event-triggered and periodically”. Exceptions include abbreviated terms that are already plural.

## Abbreviations and contractions

Abbreviations and contractions are shortened words. These are not included in a list of abbreviated terms. An abbreviation has the beginning of a word but not the end. Examples of abbreviations are “min.”, “max.”. Put a full stop after the abbreviation and capitalize it as you would the unabbreviated word. Only use abbreviations in tables and figures; write words in full in the text.

A contraction has the first and last letters of a word and sometimes other letters in between. Contractions have no full stops. Examples are Mr, Mrs, Ms, Rd, dept, Dr, St. They are also capitalized like the uncontracted word. An exception is “no.” (from the Italian “numero”, for number), which is a contraction but has a full stop to avoid confusion with the word “no”. But the plural, “nos”, is formed like other contractions without a full stop.

The common Latin shortened forms such as e.g., etc., i.e. are used regularly in CiA documents. They are punctuated as shown (i.e. not followed by a comma):

- e.g. (exempli gratia, for example);
- etc. (et cetera, and other things);
- i.e. (id est, that is).

Use “e.g.” when giving an example in brackets or at the end of a sentence: “The results can be affected by the storage conditions (e.g. time, temperature).” Or “Documented information should be controlled to ensure it is adequately protected, e.g. from loss of confidentiality, improper use or loss of integrity.” But use “for example” when the example is given as part of the sentence: “Applicable actions can include, for example, the provision of training or the re-assignment of personnel.” Never include both e.g. and etc. in the same sentence clause. For example, “e.g. managers, technicians, experts, etc.” is not acceptable.

For “a.c.” and “d.c.”: when used as an adjective, use instead “AC” and “DC”, respectively, e.g. “AC transmitter”; when used as a noun, use the full forms “alternating current” and “direct current”, respectively, at least in the first instance. The abbreviated terms “a.c.” and “d.c.” can be used subsequently. Do not use the term “r.f.” as it is obsolete: when used as an adjective, use instead the abbreviation “RF” or the full form “radio-frequency” (including the hyphen); when used as a noun, use instead the full form “radio frequency”. Do not use “ca.” as an abbreviation of approximately. Write instead “approximately” in the text or “≈” in tables. Do not write “~” instead of “≈” in a table.

## Punctuation

Punctuation helps make meaning clear, but there are changes in practice over time and different writers adopt different approaches. The priority for CiA documents is to be easily understandable and unambiguous. Use punctuation consistently within a document.

The phrase “and/or” is often used in English to express “either or both” of two options. The meaning can be ambiguous, especially in translation to other languages where the “/” is not a recognized punctuation mark.

Avoid using “and/or” in a document to avoid confusion and misapplication. Use the construction “either x or y, or both” instead.

CiA documents do not use the ampersand (&). Always use the word “and” instead.

When using apostrophes to indicate possession, the apostrophe comes before the “s” in the singular and after it in the plural: “The sample’s identification number...”; “The users’ feedback...”. The meaning can often be made clearer by rewording, e.g. “the identification number of the sample”. For plural nouns not ending in “s”, the apostrophe comes before the “s”, e.g. “people’s opinions”. Phrases such as “two weeks’ time”, “six months’ development”, “nine years’ worth” need apostrophes.

Do not use an apostrophe for plurals of names, abbreviated terms, numbers, or words not usually used as nouns, e.g. two Johns, URNs, 1990s, the three Rs, dos and don’ts.

Sometimes clarity is needed when letters and symbols are referred to as objects, e.g. subtract the xs from the ys. In these cases, use quote marks and not apostrophes, e.g. subtract the “x”s from the “y”s.

CiA documents use the Oxford (serial) comma before the last item in a list. For example: “The capture, measurement, and analysis of the data should be automated.”

Use plenty of full stops. They keep sentences short. This helps the user. Do not use full stops between letters in abbreviated terms or at the end of clause or sub-clause headings, table titles, figure titles, normative references or bibliographic entries.

Hyphens in words or phrases can improve clarity and avoid misinterpretation. Use hyphens consistently throughout a document or series.

In case of doubt, follow the spelling of the Oxford English Dictionary<sup>5</sup>.

A word formed from a prefix plus a word is not usually hyphenated unless the word begins with the same letter as the last letter of the prefix: multilateral, bilingual, misled, sub-clause, interlaboratory; but anti-inflammatory, pre-eminent, re-enter.

Words beginning with co- (meaning joint), anti-, non- and ex- (meaning former) tend to keep their hyphen, e.g. co-worker, anti-reflective, non-existent, ex-president (but cooperate, coordinate, antidote).

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<sup>5</sup> <https://www.lexico.com/>

Prefixes before a capitalized name, number, or date use a hyphen, e.g. sub-Saharan, pre-2000.

Words formed with suffixes are generally not hyphenated, e.g. sizeable, hyphenate, fruitful, patronize, greenish, kindness, twofold (but industry-wide, oil-based paint, sugar-free syrup, list-style functionality).

Compound nouns are usually presented as a single word with no hyphen or as two separate words, e.g. bypass, website, labor market. Exceptions include cross-reference and decision-making.

Compound adjectives that modify the noun are hyphenated when they come before the noun, e.g. up-to-date figures, medium-term outlook, energy-deficient countries, third-party assessment, well-known problem.

Do not use a hyphen when the compound comes after the noun, e.g. “The figures were up to date”, “changes in the medium term”, “the result is well known”.

Do not hyphenate compound adjectives when the first word is an adverb ending in -ly, e.g. newly discovered planet, finely ground powder.

## Lists

CiA documents use two formats for lists.

If the list comprises several sentences, then use the following list format.

- The introductory sentence is a complete sentence and ends with a colon or a full stop.
- The list items are complete sentences that start with a capital letter and end with a full stop.

If the list comprises one sentence broken into a list format, then:

- the introductory sentence is a partial sentence and preferably ends with a colon;
- the list items start in lower case and end with a semicolon (preferred) or a comma, used consistently;
- the penultimate list item does not include “and” or “or”, except to avoid ambiguity;
- the final list item ends with a full stop.

A list can be subdivided up to three levels.

Use numbered lists so that it is easy to cross-reference a specific list item.

For a numbered list use: a), b), c) for the first level; 1), 2), 3) for the second level; and i), ii), iii) for the third level.

Avoid having more than one numbered list in a clause/sub-clause. If a second numbered list is necessary, insert a new clause/sub-clause to separate it from the first list or use an unnumbered list.

There may be unlimited unnumbered lists per clause/sub-clause.

## Quotation marks

CiA documents uses double quotation marks. For quotes inside quotes, use single quotation marks. When the quote is a full sentence and stands completely alone, put the punctuation mark (e.g. full stop) before the closing quotation mark. When the quote is within a sentence and the punctuation mark is part of the quote, keep it within the quotation marks. When the quote is within a sentence and the punctuation mark is not part of the quote, place it outside the final quotation mark.

## Em and en dashes

Use spaced em dashes (—) between the elements in titles and between figure or table numbers and titles:

- “CiA profile for encoders — Part C: Mapping to classic CANopen”
- “Figure 1 — EMCY protocol”
- “Table 1 — Parameter value definition”

Use closed-up en dashes (–) in ranges in references, e.g. “pp. 45–49”.

Spaced en dashes are used as parenthetical dashes, e.g. “The indication can be either analog – vernier scale or circular scale – or digital.”

Use an en dash instead of a hyphen between two names to show joint authorship or ownership, e.g. “The CiA–SAE agreement”.

## Numbers and dates

The rules for the representation of numbers, quantities, units, and values are given in ISO/IEC Directives, Part 2.

In general, write numbers as words up to nine and use figures after that. However, exceptions may be made to improve readability.

Be consistent within sentences, e.g. “Transmit four data-bytes followed by sixteen bits containing the CRC data”.

Use words for approximations, e.g. “696 measurements” but “about seven hundred measurements”.

Use figures with units of measurement, amounts of money, and ages, e.g. “The 3-year-old subsea-controller weighed 250 kg”.

Use figures if numbers are being compared, e.g. “The resolution was adopted by 8 votes to 6, with 5 abstentions”.

Always use figures with the percentage symbol (%), e.g. “an increase of 5 %”.

In text, use “per cent” not “percent” (two words) but “percentage”. For example, “expressed in per cent”, “down by half a per cent”; “the percentage of cases” or “a small percentage increase”.

Use “to” instead of a hyphen between figures, even in tables, e.g. “5 mm to 10 mm”.

Use words if the figure starts a sentence, e.g. “Eleven samples should be taken”. There is no need to also give the figure in brackets following the words.

If the number is very long, try to redraft the sentence, e.g. rather than “One thousand one hundred and four people were tested” write “Testing was carried out on 1 104 people”.

Write “100 million USD” rather than “100 000 000 USD” to avoid a string of zeros, except in tables.

Use “one billion” for “1 000 million”.

Sometimes using a variety helps to make the meaning clear, e.g. “Three 2-week courses followed the six 4-week courses”.

Write first, second, third rather than firstly, secondly, thirdly.

Write “replace the third paragraph” and not “replace paragraph 3”.

## Dates

In text, write “31 October 2020” (day, month, year; no comma between month and year; no 31st or 23rd or 5th).

For duration of time, write:

- “10 to 15 March” and not “from 10–15 March”
- “2020 to 2030” and not “2020–2030” or “2020–30”
- “the twentieth century” and not “the 20th century”
- “the twenty-first century” and not “the 21st century”

In tables or figures, use the format “2020-10-31” (YYYY-MM-DD). Avoid ambiguous phrases such as “last year” or “recently” since a publication is likely to remain in use for several years. Give the date instead.

## SI units

CiA documents use the International System of Units (SI) for measurement, as described in ISO 80000 (parts 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, and 12), and IEC 80000 (parts 6 and 13). There are seven base units:

- quantity: name of unit
- amount of substance: mole (mol)
- electrical current: ampere (A)

- length: meter (m)
- luminous intensity: candela (cd)
- mass: kilogram (kg)
- thermodynamic temperature: kelvin (K)
- time: second (s)

When non-SI units need to be used, equivalent units can also be given in brackets. Some equivalent units use a decimal point rather than a decimal comma, e.g. inches, feet, miles. For example, write: 5,6 km (3.5 miles).

## Mathematical formulae and symbols

The rules for the representation of mathematical formulae and symbols as given in ISO/IEC Directives, Part 2 apply.

Use the symbols below corresponding to some basic quantities, defined in ISO 80000 (all parts), IEC 80000 (all parts), and ISO 3534 (parts 1, 2, 3, 4).

## Referencing

The rules for the presentation of references as given in ISO/IEC Directives, Part 2 apply.

Use the phrase “this document” when referring to the CiA document itself in the text.

Always use the CiA document identifier (document number and type) rather than the title when referring to a CiA, IEC, ISO, or SAE document in the text, including when a specific element (clause/sub-clause, table, figure, etc.) is referred to.

When referring to the whole document, use an undated document number unless it is necessary that the user refers to a specific edition: “...in accordance with CiA 123-4.”

Sources of terminological entries are often other documents. Reference them by document number in the [SOURCE] line.

EXAMPLE

### 3.11

#### Error Frame

frame indicating the detection of an error condition

NOTE 1 to entry: It comprises a 6-bit error flag and an 8-bit error delimiter.

[SOURCE: ISO 11898-1:2015, 10.4.4.2 and 10.4.4.3]