Espressif

Manual of Style

Version 1.1
Espressif Systems
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About This Document

This is the first release with a preliminary outline. The order of chapters and their contents will be updated in upcoming releases.

Release notes

Date	Version	Release notes
May 2019	V1.0	Release 1
June 2019	V1.1	Updated links to Espressif Product Names and Espressif Term Base.

Documentation Change Notification

Espressif provides email notifications to keep customers updated on changes to technical documentation. Please subscribe at https://www.espressif.com/en/subscribe.

Certification

Download certificates for Espressif products from https://www.espressif.com/en/certificates.

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1. General Conventions

We would like our products to be easy to understand, attractive to use, and inspiring. We provide information about these products in technical documentation like guides, manuals, datasheets, leaflets, test reports, and other technical materials. To get our message across this documentation should be well structured, uniform, and easy-to-read. Also, it should be consistent across products and product versions, so that customers are more likely to stay with us.

To promote consistent and attractive technical documentation, we are providing this guide which describes how text should be organized, spelled, formatted, and so on. Not only will you find some rules here, but also ideas on how to organize your text in a more optimal way. Feel free to try these ideas and check if it makes your text more attractive or more appropriate to your audience. When doing so, you are welcome to share your opinion about how this guide can be improved.

1.1. American or British Spelling

There are several areas in which British and American spelling are different. At Espressif, we follow American spelling.

Example:

Difference	American Spelling	British Spelling
Words ending in -er or -re	center	centre
Words ending in -or or -our	color	colour
Words ending in -ize or -ise	apologize	apologize or apologise
Words ending in -yze or -yse	analyze	analyse
Words ending in -ense or -ence	license	licence

How to enable American spellcheck in word processors:

- When using MS Word, go to Review > Language, and then select “(US) English”.
- On Mac Pages go to Edit > Spelling and Grammar > Show Spelling and Grammar, and then select “U.S. English”.

If you are not sure about how to spell a word, consult the *Merriam-Webster’s Collegiate Dictionary*.

1.2. Active vs. Passive Voice

In both English and Chinese technical writing, when writing manuals and user guides, we use active voice and try to avoid passive voice except for rare instances. Active voice sentences are usually more engaging to the reader and easier to understand.

When you start reading a sentence in the active voice, you can clearly identify who or what performs or should perform a certain action (Press the Boot button to enter

Upload mode), while passive voice sentences start with the action recipient (Upload mode is entered after pressing the Boot button) or the action itself (Entering Upload mode is done by pressing the Boot button).

When you use the passive voice, a reader may have problems distinguishing between actions by the recipient and by the user.

Example:

Preferred	Avoid
Press the EN button to reset the system.	The system is reset by pressing the EN button.
按下 EN 键使系统复位。	按下 EN 键，系统被复位。

If a sentence in the active sounds like blaming the user, you can use the passive voice.

Example:

Preferred	Avoid
If the upload fails, the serial port name may have been entered incorrectly.	If the upload fails, you may have entered an incorrect serial port name.
上传失败可能是因为输入了错误的串口名称。	上传失败可能是因为你输入了错误的串口名称。

You can also retain the active voice by rewording the sentence:

“If the upload fails, please check the serial port name.”

Another situation when you might prefer the passive voice is to emphasize the action on the recipient or if the actor is irrelevant or unknown. This is typically the case when writing test reports, where the reader is usually more concerned with the test results rather than the party performing the testing.

Preferred	Avoid
All data was recorded in the quasi-peak and average detection mode.	I have recorded all data in the quasi-peak and average detection mode.
所有数据均以准峰值和平均检测模式记录。	我以准峰值和平均检测模式记录了所有数据。

In formal documents, like datasheets or specifications, the passive voice can be used more frequently.

1.3. How to Address Readers

Write documentation in second person.

You promote a friendly tone and keep users more engaged with documentation by addressing them as “you”. Use the second person with imperative mode and active voice when writing procedural steps. The imperative mode will make your descriptions short and will help eliminate the confusion around who or what performs specific procedural actions.

Another advantage of writing in second person is that you avoid third person pronouns that are gender specific as she, he, hers and his.

If you are bound to writing in third person, use pronouns “they” and “that”, but verify if you can refer to the subject in plural. Depending on the target audience, you may also use third-person plurals such as “the users” or “the developers”（中文里为“用户”或“开发者”）.

Use of the first-person singular pronoun “I” is acceptable when writing a question in FAQs, as well as in blogs, when authors describe their opinions or actions.

Avoid switching personal pronouns (e.g., addressing the target audience as “you” and then as “they”) within a single document or across the documents of the same type. There might be an exception to this rule if a document consists of sections that require a different way of addressing described above.

1.4. Simplified or Traditional Chinese

We use simplified Chinese.

1.5. Define Abbreviations and Acronyms at First Use

Write out a full term for each abbreviation or acronym at its first use.

Example:

Mesh development framework (MDF), not Mesh Development Framework (MDF).

If a full term is given in a heading, provide it together with the abbreviation. If this makes the heading too long, provide the abbreviation in the following text.

If an abbreviation or acronym is more familiar than the full term, then, probably, there is no need to write it out. You can also follow this abbreviation or an acronym with the full term in parentheses, e.g., USB (universal serial bus).

If a document is very long, and people are supposed to use it as a reference guide, consider establishing a section “Index of Abbreviations and Acronyms.”

1.6. If You Do Not Know How to Structure a Phrase

- Check in other documents that describe a similar concept.
- Look up similar phrases using refined web search techniques:
  - Put the key parts of your phrase inside quotes, for example: “task scheduler”.
  - Add “-“ in front of a word you want to exclude from the search, for example: “task scheduler” -windows
- Use synonyms of original words in your search phrase.
- Look for information in monolingual dictionaries (specific computer dictionaries). Here are a couple of examples:
  - The Illustrated Dictionary of Electronics, published by McGraw-Hill
  - Microsoft Computer Dictionary, published by Microsoft Press

- Oxford Dictionary of Computer Science, published by Oxford University Press

1.7. Capitalize Heading Titles

In the paper and heading titles, capitalize the first letter of every word except for:

- Articles (a, an, the).
- Coordinating conjunctions (and, but, for, or, nor).
- Prepositions of four letters or less; unless these prepositions are the first or last words. Prepositions of five letters and above should be capitalized (Before, Through, Versus, Among, Under, Between, Without, etc.).

Example:

ESP8266 FOTA Demonstration with Phone App

Demonstration Guide on Controlling ESP8266 Devices in IoT Cloud by Mobile Phone

Webpage titles are used to create a clickable table of contents that is often in the form of a menu on the left to navigate the document structure. Make the titles descriptive and preferably fit them within one row of text.

2. Punctuation

First and foremost, use English punctuation in English writing and Chinese — full-width, double-byte — punctuation in Chinese writing. Please do not use English punctuation marks in Chinese text and vice versa.

Punctuation Mark	English	Chinese	Notes
Full stop (Period)	.	。	
Comma	,	，	
Enumeration Comma	N/A	、	Chinese punctuation mark dividing listed items within a sentence. In English, its role is fulfilled by a regular comma.
Colon	:	：	
Semicolon	;	；	
Question Mark	?	？	
Exclamation Mark	!	！	
Quotation Marks	“”	“ ”	
Quotation Marks for titles	N/A	《》	Chinese punctuation mark used to signify book titles, song titles, movie titles, etc. In English, its role is fulfilled by regular quotation marks.
Parentheses	( )	（）	

However, for texts where both English and Chinese writing is used side-by-side, please follow specific rules provided in this chapter.

2.1. Spaces

2.1.1. General rules

Use English spaces in the following cases:

- Between a number and the following unit of measure
- Between an English punctuation mark and the following English word

English Text	Translated Text	Notes
Powered by 40 nm technology, ESP32 provides a robust, highly integrated platform.		

When specifying a version number of a document or software application (V+number), do not add a space between “V” and the number.

English Text	Translated Text	Notes
Download the latest document (V1.0).	下载最新版本的文档 (V1.0)。	

Do not use English spaces around hyphens, dashes, and slashes.

Correct	Incorrect
32-bit core	32 - bit core
AT+WPS—设置 WPS 功能	AT+WPS — 设置 WPS 功能
On/Off switch	On / Off switch

> ⚠ ***Notice:***
>
> *Please pay special attention to spaces in code or commands. For example:*
>
> - *There must not be any spaces in the following AT command:* AT+UART=115200,8,1,0,3.
> - *However, there must be a space in the following terminal command:* make flash.

2.1.2. Mixing Chinese Writing with Numbers and English Writing

In Chinese texts with English inserts, only use English spaces:

- Between Chinese characters and English letters
- Between Chinese characters and English punctuation marks
- Between Chinese characters and numbers

English Text	Translated Text	Notes
ESP32 integrates Wi-Fi (2.4 GHz band) and Bluetooth 4.2 solutions on a single chip.	ESP32 是集成 2.4 GHz Wi-Fi 和蓝牙 4.2 的单芯片方案。	
	关于 ESP-IDF 的基本使用，可参考目录下的 README (.md) 文件。	See Section 2.2 *Parentheses*
	乐鑫 (Espressif) 是一家无晶圆厂半导体公司。	See Section 2.2 *Parentheses*
	乐鑫研发和设计 IoT 业内集成度高、性能稳定、功耗低的无线系统级芯片。	

But never use English spaces around Chinese punctuation marks.

English	Translated Text	Notes
	ESP-WROOM-32 模组（内置了 ESP32 芯片）	See Section 2.2 *Parentheses*
	乐鑫总部位于中国上海 (Shanghai, China)，是一家无晶圆厂半导体公司。	See Section 2.2 *Parentheses*. Here, there is an English space before the left parenthesis, but no space after the right parenthesis as it is followed by a Chinese punctuation mark.

2.2. Parentheses

If the text enclosed in the parentheses only consists of English letters and/or numbers:

- Use English parentheses
- Separate the text outside of English parentheses with one English space. See Section 2.1.2 *Mixing Chinese Writing*.

English	Translated Text	Notes
	关于 ESP-IDF 的基本使用，可参目录下的 README (.md) 文件。	

If the text enclosed in the parentheses consists of Chinese characters or, among English letters and/or numbers, includes Chinese characters:

- Use Chinese parentheses.
- Do not add spaces between Chinese parentheses and the text outside of them.

English Text	Translated Text	Notes
	ESP32 集成了 Wi-Fi（2.4 GHz 带宽）和蓝牙 4.2。	
	准备一台 PC（安装 Windows 操 作系统）	

2.3. Hyphens and Dashes

Name	Symbol	Keyboard Shortcut			
		Windows	Linux	macOS	LaTex
Hyphen	-	-	-	-	-
En dash	–	–	–	Option + -	Option + -
Em dash	—	—	—	Shift + Option + -	—

2.3.1. When to Use Hyphens

Use hyphens for modifiers that consist of two or more words.

Preferred	Avoid
small-sized development board	small sized development board
built-in operating system	built in operating system
2-bit data length	2 bit data length

Preferred	Avoid
state-of-the-art technology	state of the art technology

Use hyphens or en dashes to indicate a range of values, without spaces before and after.

Hyphen Range Style	En Dash Range Style
June-July 1967	June–July 1967
pp. 38-55	pp. 38–55

However, in ranges that include negative numbers, a tilde (~) can also be used to avoid ambiguity or awkwardness (for example, a temperature range of −40 °C ~ −85 °C), with spaces before and after.

2.3.2. When to Use En Dashes

- To indicate a minus sign (for example, “1–2”).

  Exception:

  Use hyphens when writing code.

- To indicate negative numbers, for example, “–1”.
- To contrast values, or illustrate a relationship between two things, for example, “Pycom–EspressifHackathon”.

2.3.3. When to Use Em Dashes

Use an em dash to denote a break in a sentence or to set off parenthetical statements.

Example:

The information in your spreadsheet—numbers, formulas, and text—is stored in cells.

2.4. Slashes

The word slash usually implies the forward slash “ / ” which is used in writing and computer coding. However, there is also the backslash “ \ “ which is used in computer coding only.

Use a **slash** character in the following cases:

- In constructions that imply a combination

  I/O pad

  read/write operation

- For fractions

  1/3

- As a separator for compound units of measure.

100 Mbit/s

- As the path separator in OS Linux and other Unix systems

```
cd ~/esp/hello_world
```

- For website URLs

  See https://www.espressif.com/

Use a **backslash** character in the following cases:

- As the path separator in MS Windows

```
cd C:\Users\%userprofile%\esp\hello_world
```

Do not use slashes in the following cases:

- A substitute for "or".

Preferred	Avoid	Notes
Some embedded memories can be accessed via the data bus or the instruction bus.	Some embedded memories can be accessed via the data/instruction bus.	Not clear if the slash mark indicates "or" or "and".

2.5. Quotation Marks

Differentiate between single quotation marks and double quotation marks.

In English, you divide a quote from the surrounding text with double quotes. If you add a quotation within an already quoted text, use single quotation marks. This concept can be represented as "… '…' …".

2.6. The Oxford Comma

The Oxford Comma is a comma that is used before the conjunction that joins the last two enumerated items within a sentence. The Oxford Comma helps to prevent confusion with regard to whether the last two items in a series are related.

Preferred	Avoid	Notes
The table should provide separate columns for user IDs, their first names, and last names.	The table should provide separate columns for user IDs, their first names and last names.	The phrase *their first names and last names* does not make it clear whether first names and last names should be placed in one column or in separate columns. Adding the Oxford Comma before *and*, disambiguates the situation. Now it is clear that you need two separate columns.

2.7. Brackets

2.7.1. Square Brackets

Use square brackets as follows:

- **Within parenthetic text**. Use square brackets when nested parentheses are needed.

  （不能是简单 Type [如 string 或 Guid]）

- **For optional command-line entries**. Use to indicate an optional parameter or other types of entries.

  ```
  idf.py -p PORT [-b BAUD] flash
  ```

Do not put spaces between brackets and the text that these brackets enclose, for example, [Module Name].

2.7.2. Angle Brackets

Use angle brackets and lowercase letters for tags, for example the <h1> tag, the <font> tag.

You can use a right-angle bracket ">" to show navigation in menus. Put a space before and after the bracket.

Examples:

Click **File** > **Export To** > **PDF**.

2.8. Punctuation in Lists

The following notes on punctuation in lists should be made:

- Place a colon ":" at the end of an introductory phrase.
- Use a full stop at the end of each item in a list of complete sentences, such as this one.
- Omit punctuation at the end of each item in a list of sentence fragments.

Here is an example of a list consisting of sentence fragments. Its characteristic features are as follows:

- Short items
- Absence of active verbs
- Abundance of Participial phrases

3. Numbers

This chapter summarizes some of the widely-applicable guidelines for handling numbers in technical context. In financial, marketing and other contexts where the guidelines may not be applicable, editorial judgment must be used to preserve clarity, precision, logic, and readability within any particular document.

3.1. Arabic Numerals Versus Spell-out

3.1.1. When to Use Arabic Numerals

When to Use Arabic Numerals	Example	Comment
When a single-digit whole number is used as an adjective	8-digit code	
For 10 and greater whole numbers	ESP8266 has 17 GPIO pins.	For large numbers that are not expressed with high precision, the text form may be a combination of numerals and words, e.g., 7 billion people.
For 2-digit ordinals and larger	10th, 31st	Do not use ordinal numbers for dates (e.g., April 1, not April 1st).
Measurements	1 byte 2.4 GHz 3 V 5 grams	This is true whether the measurement is spelled out, abbreviated, or replaced by a symbol.
To express dates, the time of day, pages, chapters, figures, steps, notes, and numbered items in documents	April 8 09:30 Chapter 2 Table 2-1 Step 1	This rule does not apply to expressions with hours, days, weeks, or other units of time. Example: 24 hours, two days, three years
Percentages	90% duty cycle	
When used as input	Type 1, and then press Enter.	
When representing parameter values	The default value of this register is 0.	

3.1.2. When to Spell out Numbers

When to Spell out Numerals	Example	Comment
Single-digit whole numbers	ESP32 has three UART controllers.	
While beginning a sentence with a number	Eighteen pads have low power capabilities and analog functions.	It is better to reword the sentence so that the number comes later. Example: Out of the 40 physical GPIO pads, 18 pads have low

When to Spell out Numerals	Example	Comment
		power capabilities and analog functions.
Fractions	one-third	
Single-digit ordinal numbers	first, second	Do not use ordinal numbers for dates (e.g., April 1, not April 1st).

Maintain consistency among categories of information; that is, if one number in a category requires a numeral, use numerals for all numbers in that category.

Example:

Preferred	Avoid
ESP32-S2 has 1 LCD interface, 2 UART interfaces, and 43 GPIO interfaces.	ESP32-S2 has one LCD interface, two UART interfaces, and 43 GPIO interfaces.

When two numbers that refer to separate categories must appear together, spell out one of them.

Preferred	Avoid
two 8-bit D/A converters	2 8-bit D/A converters

3.2. 10,000 and Greater Numbers

Use a comma "," to mark off groups of three digits for numbers of five digits or more.

Example:

10,240 bytes

10,000 B.C.

Exception:

Do not use commas in page numbers, addresses, and decimal fractions.

Example:

page 10011

Pune-411045

3.14159.

3.3. Numeric Ranges, Dimensions, Series, and Placement of Units

- A range of numbers and the accompanying unit can be expressed with a single unit symbol after the second number of the range, except when the symbol cannot be separated from the number (e.g., the percent symbol). Alternatively,

the unit symbol may follow both numbers of the range. Whichever style is selected, use it consistently.

Example:

23 to 47 kV or 23 kV to 47 kV

10% to 15% not 10 to 15%

- If a range begins a sentence, spell out the first number and write the second as a numeral, or recast the sentence. Generally, any accompanying units will appear only after the second number and may be abbreviated. If the unit must also appear after the first number (as for the percent symbol), then write out both units or recast the sentence.

  Example:

  Twenty-three to 25 km not Twenty-three to twenty-five kilometers

- For dimensions, use a multiplication symbol (not a small letter "x") or the word "by" to separate the measurements.

  Example:

  10 × 55 × 5 mm or 10 mm × 55 mm × 5 mm

- For a series of numbers, place the unit after the last numeral only, except when the unit symbol cannot be separated from the number.

  Example:

  12, 17, 43, and 66 kV

  diameters of 5 and 9 mm

  15%, 22%, or 31% not 15, 22, or 31%

For more information on using units of measure and unit symbols, please refer to Chapter 4. *Measurement Units and Abbreviations*.

3.4. When Referring to Money

3.4.1. Currency Sign vs. Currency Code

It is recommended that currency amounts are expressed in accordance with the International Organization for Standardization (ISO) currency codes, instead of currency signs. Currency codes are specific to a currency, and cannot be confused or misinterpreted by the reader. Currency symbols such as the dollar sign ($) are not unique and are easily misread.

Example:

Preferred	Avoid
The ESP32-DevKitC is priced at 55 CNY.	The ESP32-DevKitC is priced at ¥55.

The following table shows examples of currency codes.

Currency	Code
yuan renminbi	CNY
U.S. dollar	USD
Canadian dollar	CAD
Hong Kong dollar	HKD
euro	EUR
pound sterling	GBP
Swiss franc	CHF
yen	JPY

If you do need to use a currency sign, place it before the figure: ¥300, £100, etc. Always make clear to what currency you are referring.

3.4.2. Abbreviations

Avoid using abbreviations (e.g., m, M, MM for millions, K for thousands), when referring to money in technical context. In financial or other contexts, please consult department-specific guidelines.

3.5. Fractions and Decimals

- Hyphenate spelled-out fractions used as adjectives or nouns.

  Example:

  One-third of the book

  Two-thirds completed.

- Write decimals with a period (full stop), not a comma: 0.75, 6.4.
- When units of measure are not abbreviated, use the singular for quantities of one or less, except for zero, which takes the plural.

  Example:

  0.5 inch

  0 inches

  5 inches

3.6. Phone Numbers

It is recommended that telephone numbers follow the International Telecommunication Union (ITU) standard: ITU-T E.123.

International telephone numbers begin with the plus sign followed immediately by the country code, then by the area code, and the number.

Example:

You can reach Espressif by calling +86 021 6### ####.

The leading plus (+) signifies the international prefix. Spaces are used to visually separate groups of numbers.

National telephone numbers begin with area code included in parentheses followed by the number.

Example:

You can reach Espressif by calling (021) 6### ####.

The parentheses indicate that the area code is not always dialed and they should not be used in an international number.

For better readability, please use non-breaking spaces to keep telephone numbers on the same line. If a telephone number is close to the end of the line, you get +86 021 6### ####. The number is treated as one word.

3.7. Addresses (Mailing)

Mailing addresses may have different standard formats in different places. Please follow the mailing address formats when writing Espressif corporate addresses.

Espressif China Office Mailing Address Format in Chinese

Address Elements	Description
上海浦东新区张江高科	[province, city, district]
碧波路 690 号 2 号楼 101 室	[street name with street number, building name or number, room number]
乐鑫信息科技（上海）股份有限公司	[company name]
邮编 201203	[postal code]

Espressif China Mailing Address Format in English

Address Elements	Description
Espressif Systems (Shanghai) Co., Ltd.	[company name]
Suite 101, Block 2, 690 Bibo Road	[room number, building name or number, street name]
Zhangjiang High-Tech Park, Pudong	[district, city]
Shanghai, China 201203	[province, country, postal code]

Espressif Czech Republic Office Mailing Address Format

Address Elements	Description
Espressif Systems (Czech) s.r.o.	[company name]
Holandská 878/2	[street name + block number and/or building number]
639 00 Brno-Štýr˘ice	[postal code + city name]

Address Elements	Description
Czech Republic	[country]

Espressif India Office Mailing Address Format

Address Elements	Description
Espressif Systems (India) Private Limited	[company name]
G-1, Eco Tower	[flat number, building name]
Baner-Pashan Link Road	[street number, street name]
Baner	[locality or neighborhood]
Pune-411045	[city, postal code]
Maharashtra, India	[country]

3.8. Numbers in Chinese Text

If Arabic numerals are used in English text, please use Arabic numerals in the translated text. If English words are used in English text, please use Chinese words in the translated text.

Example:

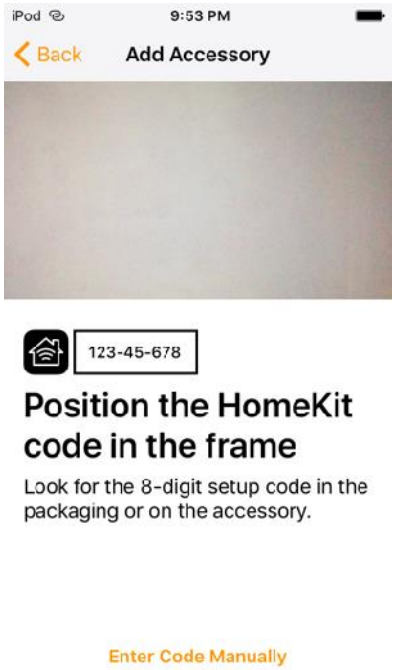
English	Translated Text	Notes
20 mm	20 mm	
7 billion people	70 亿人口	
10%	10%	
10 percent	百分之十	For percentages, don’t mix numbers and words, e.g., 百分之 10.
one-third	三分之一	

3.9. When Referring to Numbers in Examples or Interfaces

Represent numbers taken from examples or the user interface exactly as they appear in the example or the user interface.

Example:

Preferred	Avoid
See 123-45-678, as shown in the interface below.	Call 123 45 678, as shown in the interface below.


iPod
9:53 PM
Back
Add Accessory
123-45-678
Position the HomeKit code in the frame
Look for the 8-digit setup code in the packaging or on the accessory.
Enter Code Manually

4. Measurement Units and Abbreviations

This chapter provides guidelines for units of measure and also lists abbreviations and symbols for frequently used units.

4.1. General Rules for Using Units of Measure

Follow these guidelines:

1. When to abbreviate units and when to spell out units as words
   - Abbreviate units when you report a numerical value, e.g., “The ESP32 Wi-Fi/BT firmware can only support 40 MHz crystal oscillator for now.”
   - Always spell out a unit of measure as a word if a numeral does not precede it, e.g., “The default baud rate for ESP8266 is 115200.”
   - When starting a sentence with a number and unit, both must be spelled out as words, e.g., “One thousand six hundred and eighty-seven kilograms of ground beef were randomly sampled and tested for E. coli contaminants between August 21 and November 21, 1995.”

     Even if a sentence starts with a spelled-out number and unit, use numerals when appropriate in the rest of the sentence, e.g., “One thousand six hundred and eighty-seven kilograms of ground beef were randomly sampled, resulting in 2.5 kg of samples. Then the samples were tested for E. coli contaminants between August 21 and November 21, 1995.”

     You can avoid spelling out number and unit by restructuring a sentence, e.g., “The ground beef in the amount of 1687 kg was randomly sampled and tested for E. coli contaminants between August 21 and November 21, 1995.”
2. When to hyphenate:
   - When you use a spelled-out unit of measure in a compound adjective, hyphenate the compound, e.g., 17-inch display, 3-meter cable.
   - When you use an abbreviated unit in a compound adjective, do not hyphenate it; add a space between the number and the abbreviation. E.g., 20 nA battery, 30 GB capacity.
3. Unless otherwise noted, singular and plural units are abbreviated the same.
   - One kilogram and 10 kilograms are abbreviated as 1 kg and 10 kg.
4. Capitalization: With the exception of degrees Celsius, Fahrenheit, and Rankine, units of measure derived from a proper name are not capitalized when spelled out, but their unit symbols are capitalized. E.g., the unit symbol for joule is J.
5. Mixing spelled-out units and their abbreviations:

- Do not mix spelled-out units and their abbreviations in complex units of measure. Either spell out complex units or use their abbreviation (m/s, Bd/s).

Preferred	Avoid
meters per second or m/s	m/second
baud per second or Bd/s	Baud/s

- Do not mix a spelled-out prefix with an abbreviated unit or an abbreviated prefix with a spelled-out unit.

Preferred	Avoid
kHz	kiloHz, khertz

4.2. Prefixes for Units of Measure

Factor	Prefix	Abbreviation
10^{24}	yotta	Y
10^{21}	zetta	Z
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto	h
10^{1}	deka	da
10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	µ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a
10^{-21}	zepto	z
10^{-24}	yocto	y

4.3. Frequently Used Units of Measure

Factor	Prefix	Abbreviation
ampere	electric current	A
ampere-hour	electric charge, derivative of coulomb	Ah
amperes per meter	magnetic field strength	A/m
amperes per square meter	current density	A/m^2
baud	the speed at which information is sent	Bd
bit	the most basic unit of information that can be stored in a computer	bit
bits per second	speed of data transmission	bit/s
byte	a basic unit for storing computer information, used for measuring the size of a document. A byte is usually made of eight bits	B
centimeter	length	cm
characters per inch	letter spacing in typography	cpi
characters per second	digital data transfer rate	cps
coulomb	electric charge	C
decibel	sound intensity	dB
degree	angular measure	°
degree Celsius	temperature	°C
degree Fahrenheit	temperature	°F
dots per inch	the ability of a computer screen or printer to produce a clear image/resolution	dpi
exabyte	a unit for measuring computer information, equal to 1024 PB	EB
Farad	capacitance	F
gigabit	a unit of information equal to 1024 Mbits	Gbit
gigabit per second	speed of data transmission	Gbps
gigabyte	a unit for measuring computer information, equal to 1024 MB	GB
gigahertz	a unit for measuring the frequency of sound waves, radio waves, and computer clock signals, equal to 1000 MHz	GHz
gilbert	magnetomotive force	Gb
gram	mass, weight	g
henry	inductance	H
hertz	a unit for measuring the frequency of sound waves, radio waves, and computer clock signals	Hz

Factor	Prefix	Abbreviation
joule	energy	J
kilobits per second	the speed of a modem	kbps
kilobyte	a unit for measuring computer information, containing 1024 bytes	KB
kilohertz	frequency	kHz
kilohm	electric resistance	k
kilometer	length	km
kilowatt	power	kW
kilowatt-hour	energy (usually electric power consumption)	kWh
megabit	a unit of information equal to 1024 Kbits	Mbit
megabits per second	speed of data transmission	Mbit/s
megabyte	a unit for measuring computer information, equal to 1024 kB	MB
megahertz	a unit for measuring the frequency of sound waves, radio waves, and computer clock signals, equal to 1000 kHz	MHz
meter	length	m
millimeter	length	mm
million instructions per second	computer speed	mips
ohm	electric resistance	Ω
petabyte	a unit for measuring computer information, equal to 1024 TB	PB
second	a unit of time	s
terabyte	a unit for measuring computer information, equal to 1024 GB	TB
tesla	magnetic flux density	T
volt	electric potential difference, electromotive force	V
watt	power	W
watt-hour	energy	Wh
yottabyte	a unit for measuring computer information, equal to 1024 ZB	YB
zettabyte	a unit for measuring computer information, equal to 1024 EB	ZB

5. Editing References

Use cross-references to direct users to related information that might add to their understanding of the documentation content.

Try to write and edit so that you use cross-references only for information that is not essential to the task at hand. For example, users should not have to look up information to complete a procedure. If your content has too many cross-references, consider restructuring it.

Unless you have no other choice, do not make cross-references to information that is not within your control, especially hyperlinks. Websites are always being modified and reorganized, and few things are as frustrating to the user as an invalid cross-reference.

5.1. Structure and Style of Cross-references

- Information about why a cross-reference might be of interest should precede the cross-reference itself.

  Example:

  The guidelines for handling numbers in technical context can be found in Chapter 3 *Numbers* of this manual.

- For cross-references to figures, tables, sections or chapters in another publication, provide only the title. The number may be updated without your knowledge.

  Example:

  See Chapter *Overview* in *ESP32 Datasheet*.

- Structure the cross-reference from the most specific to the most general reference.

  Example:

  For pin layout of ESP32, see Section *Pin Layout* in Chapter *Pin Definitions*, in *ESP32 Datasheet*.

- For online cross-references that are formatted as hyperlinks, use descriptive text for the hyperlink; do not use blank expressions, such as ”click here”.

  Example:

Preferred	Avoid
For more information about ESP32, please refer to *ESP32 Datasheet*.	For more information about ESP32, click here.

5.2. Formatting of Cross-references

- If the hyperlink comes at the end of a sentence, do not make the ending punctuation part of the hyperlink.

  Example:

Correct	Incorrect
For more information about ESP32, please refer to *ESP32 Datasheet*.	For more information about ESP32, please refer to *ESP32 Datasheet.*

- Use color blue and underline to indicate external hyperlinks. Do not rely on color by itself to indicate hyperlink text. Color-blind users will not be able to see the links. In Pages and Word templates, use the Hyperlink character style, which underlines the characters and applies the color 0096FF (Hex Color #). For other types of documents, please refer to their individual template.

  Example:

  Please visit www.espressif.com.

  This functionality is defined by the Bluetooth specification.

- Use color blue, underline, and italics when referring to the title of an article/book.

  Example:

  For more information about ESP32, please refer to *ESP32 Datasheet*.

- The font weight (e.g., light, medium, bold) of a cross-reference does not need to follow that of the sentence in which it appears.

  Example:

  Download certificates for Espressif products from Espressif website.

- For cross-references to document, chapter or section titles, match the capitalization style of the document, chapter, or section title.

5.3. Cross-references in Chinese Text

Use book title marks (《...》) for Chinese titles of books, articles, newspapers, songs, films, etc.

Example:

English	Chinese	Notes
For more information about ESP32, please refer to *ESP32 Datasheet*	更多关于 ESP32 的信息请参考《ESP32 技术规格书》。	There are no spaces around Chinese punctuation marks.

6. English Grammar Tips

This section touches upon some aspects of English grammar and aims to help you avoid the most frequent mistakes.

6.1. The Indefinite Article (*A / An*)

Although the incorrect choice between the two forms of the indefinite article (*a* and *an*) occurs frequently, the good news is that this issue can be easily eradicated.

There is a ubiquitous misconception that the choice depends on the letter that follows the indefinite article. In reality, the choice depends on the *sound* that comes after the indefinite article!

When you say/write a word that starts with a consonant or a vowel with a consonant sound (e.g., *u*, *eu*, o as in *one*), you should use the *a* form of the indefinite article. However, if the first sound of a word is a vowel or a mute *h*, use an instead.

Most of the time, picking the right form of article is not hard.

Initial Consonant Sound	Initial Vowel Sound
a board	an application
a network	an example
a status	an interface

However, sometimes you should be cautious when picking the right form of the indefinite article.

Initial Consonant Sound	Initial Vowel Sound
a hard drive	an hourglass cursor [our-glass]
a one-pass compiler [wʌn - pass]	an online service
a user ['ju:zə(r)]	an update

Another tricky area is the use of abbreviations. The choice between the two forms of the indefinite article depends on how you pronounce the abbreviation.

The table below shows some examples of abbreviations whose pronunciation starts with a consonant.

A + Abbreviation	Pronunciation
A CPU	A si: - pi: - ju:
A PSRAM	A pi: - ɛs -ram
A PCB	A pi: -si:- bi:
A USB port	A ju:- ɛs - bi: port

A + Abbreviation	Pronunciation
A UART interface	A juː-ɑː(r)t interface

The following table provides examples of abbreviations with a vowel-sounding initial.

An + Abbreviation	Pronunciation
An IoT solution	An ʌɪ-əʊ-tiː solution
An RToS	An ɑː(r)- tiː- əʊ- ɛs
An MDF device	An ɛm - diː - ɛf device
An XML file	An ɛks - ɛm - ɛl file
An HDD	An eɪtʃ - diː - diː

Those who want to experientially understand why *n* is sometimes added to the indefinite article should do the following exercise. Try saying “an application” and then “a application”. Most likely, you will find the pronunciation of the first option more natural and effortless. The reason is simple: *n* functions as a liaison giving your tongue a brief support between the two *a* sounds.

6.2. On the Usage of the Future Tense

In general, procedures and tasks described in technical documents develop in time continuously. They often tend to be repetitive or even have a pre-programmed nature.

This means that when you describe procedures and tasks, the present tense should work in most cases.

Preferred	Avoid
Upon receiving this event, the event task initializes the lwIP network interface.	Upon receiving this event, the event task will initialize the LwIP network interface.
Here is an example of a random RADIUS client. It uses the password **12345678** to access hostapd.radius_clients.	Here is an example of a random RADIUS client. It will use the password **12345678** to access hostapd.radius_clients.

However, you can add some anticipation by using the future tense to emphasize the following:

- the future result of the reader's current action
- what should follow if some certain conditions are satisfied or not satisfied.

Example:

Run the command ``printenv MDF_PATH``. If the MDF_PATH environment variable has been set correctly, the command will return the path to the ESP-MDF project directory.

6.3. Misleading Pronouns

Personal pronouns in the third person, such as *it* (in the singular number) or *them* (in the plural number), can be confusing when the words they refer to are not immediately obvious.

In the example below, it is not obvious if the personal pronoun *it* refers to *change rate*, or *touch reading*.

Correct	Incorrect
You need to reset the change rate of a touch reading for each channel and write the change rate into the file.	You need to reset the change rate of a touch reading for each channel and write it into the file.

The following example shows an issue with the pronoun *them*.

Correct	Incorrect
Since the submodules on GitHub are represented as links to other repositories, this command is needed to download the actual files onto your PC.	Since the submodules on GitHub are represented as links to other repositories, this command is needed to get them onto your PC.

Them can refer to *submodules* as well as to *repositories*. Of course, you can grasp the meaning from the context, but the clarity of the sentence will significantly improve if you rewrite it. As submodules represent a set of files, you can use the synonymous phrase *the actual files* instead of repeating the same words.

Another suggestion is to avoid using *it* as an empty subject wherever possible.

Preferred	Avoid
If espwifisetmode returns ESPERRWIFINOTINIT, then the Wi-Fi driver is not initialized by espwifi_init successfully.	If espwifisetmode returns ESPERRWIFINOTINIT, it means that the Wi-Fi driver is not initialized by espwifi_init successfully.

Another example shows how a conditional sentence with *it* as an empty subject can be elegantly turned into a simple sentence.

Preferred	Avoid
The channel field of wifiscanconfig_t set to 0 indicates an all-channel scan mode.	If the channel field of wifiscanconfig_t is set to 0, it is an all-channel scan.

6.4. Avoid Using Contractions

Avoid using contractions in technical documentation, such as *here's*, *you've*, *can't*, *don't*, *it's*.

Please use full words instead.

6.5. Definite Articles Before Proper Nouns

The names of software development platforms, hosting services, and search engines do not require the definite article before them. These nouns actually belong to the category of proper nouns — names of particular people, places, companies, services, things, that are always capitalized and are never accompanied by the definite article, e.g., Beijing, China, etc.

Correct	Incorrect
This method is useful if you have a slow connection to GitHub.	This method is useful if you have a slow connection to the GitHub.

> 🕮 ***Note:***
>
> *There are some exceptions with regard to capitalization:*
>
> - *Some proper nouns can be capitalized in a different way, like iPhone, which is the decision of Apple Inc.*
> - *Some proper nouns have the definite article accompanying them, like the Hague, The New York Times. In this case, the definite article is either the part of the name, or there are some historical reasons behind its retention.*

However, if a proper noun is a modifier to the following noun, the presence of the definite article is necessary.

Correct	Incorrect
Connect the ESP32 board to a PC.	Connect ESP32 board to a PC.

Here, the proper noun ESP32 requires the definite article, as it functions as a modifier (or an adjective) specifying which particular board is to be connected to the PC in question.

Correct example:

The maximum throughput of BLE communication between ESP32 boards can reach up to 700 Kbps.

In this case, the proper noun ESP32 does not take *the*, as it represents a set of objects (ESP32 boards), without referring to one specific board. As in the previous example, the proper noun ESP32 functions as an adjectival noun. The difference, however, is that in the previous example “the ESP32” referred to one specific board that was going to be connected to a PC; hence, the use of the definite article in that case.

Appendix A. Technical Terms and Localization

The link below leads you to Espressif Term Base which lists technical terms frequently used in Espressif documentation. The terms are provided in a tabular format both in English and Chinese for easy reference.

Each term has a definition to point out exactly what is understood by the term. Please pay attention to definitions, as Espressif documentation tends to interchangeably use the terms that actually have different meanings or reserved for different purposes.

Espressif Term Base is maintained by the Documentation Team and is updated regularly.

Please go to: https://docs.qq.com/sheet/DU1dOS21GR253d2VR

Appendix B. Espressif Product Names

The link below refers you to Espressif Product Names - the document which lists up-to-date names of hardware and software products, produced by Espressif, together with their brief description.

There are many inconsistencies concerning spelling and capitalization of Espressif product names in the documentation. You are advised to consult this listing on a regular basis as product names are changed from time to time and also new products are added.

Please go to: https://docs.qq.com/sheet/DU21aclhtYXd2ZHhx

Espressif IoT Team

www.espressif.com

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