

# CURRENCY

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Print monetary units

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This packages aims at typesetting monetary units in a consistent way.

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## 1 Introduction

Strangely enough, it seems that no package deals with a convenient, normalized way to print monetary units and values. Built on the top of the `siunitx`, this package then aims at providing a consistant and coherent way to format such quantities. In particular, we consider printing values and unit

- In the ISO format (ISO 4217),
- In their usual name (dollar, euro , ...), singular and plurals,
- Using their usual symbols (\$, €, ...).

The currency code ISO 4217 specifies the code of the currency as a three-letters code. The first two ones are the code of the country according to ISO 3166. The last one is the name of the currency name.

This package creates macros for defined currencies which follow the ISO 4217 codes.

This package is then useful for current monetary units, using the decimal systems and cents, written in western format. Non decimal systems such as the *pound shilling pennies* are not supported.

## 2 Licence and Requirements

Permission is granted to copy, distribute and/or modify this software under the terms of the L<sup>A</sup>T<sub>E</sub>X Project Public License (LPPL), version 1.3 or later (<http://www.latex-project.org/lppl.txt>). The software has the status “maintained.”

The currency package needs and thus loads the packages `siunitx`, `pgfkeys`, `etoolbox`, `xparse`, `expl3`, `textcomp` and `eurosym`.

## 3 Currency definition

`\DefineCurrency{⟨ISO⟩}{⟨maps⟩}`

defines a new currency (there is no warning if a currency is being redefined).

A new currency is defined with this command. The argument (`ISO`) is the ISO format (a unique code in three letters based on country codes [ISO15; Wik15], *e.g.*, `USD` for *United States Dollar*), or any suitable name from which commands will be created. Its characteristics are defined through key-values pairs, the so-called (`map`).

When `XXX` is the ISO code (or any other code), it defines two commands `\dXXX` and `\cXXX` for using these units in the text. These commands are defined globally. See Section 4.

For example, to define the US dollars, we set

```
1 \DefineCurrency{USD}{name={dollar},plural={dollars},iso={USD},kind=iso,
   symbol={\$}}
```

Other styles may be defined through `\pgfkeys` by following this example:

```
1 \pgfkeys{/currency/my style/.style={locale=US,kind=plural}}
2 \dUSD[my style]{100.10}
```

---

100.10 dollars

### 3 Currency definition

**Key-values when defining or using a currency.** Several key-values pair are defined. Since this package relies on siunitx, it is also possible to use any key-values from this latest package, for example to control the ways the values are printed (separators, ...).

**name** =  $\{\langle name \rangle\}$  Default: ZZZ

The name of the currency (*e. g.*, dollar, yen, ...).

**plural** =  $\{\langle plural \rangle\}$  Default: *name* s

The plural form of the name of the currency.

**iso** =  $\{\langle iso \rangle\}$

The ISO code of the currency.

**symbol** =  $\{\langle symbol \rangle\}$  Default:  $\Re$

The symbol for the currency, if any (*e. g.*, €, \$, ...).

**pre-between** =  $\{\langle tokens \rangle\}$  Default: no break space

The tokens that are placed between the name and the value when the name is printed before.

**post-between** =  $\{\langle tokens \rangle\}$  Default: no break space

The tokens that are placed between the name and the value when the name is printed after.

**before** =  $\{\langle tokens \rangle\}$  Default:

What is printed before.

**before+** =  $\{\langle tokens \rangle\}$

Append the content to **before**.

**before<** =  $\{\langle tokens \rangle\}$

Prepend the content to **before**.

**font** =  $\{\langle tokens \rangle\}$

For setting up the font which is used for both the unit and the amount (previous uses of **font** are overridden).

**font+** =  $\{\langle tokens \rangle\}$

Add the content to **font**.

**after** =  $\{\langle tokens \rangle\}$

What is printed after.

**after+** =  $\{\langle tokens \rangle\}$

Append to what is print after.

**after<** =  $\{\langle tokens \rangle\}$

Prepend to what is print after.

`prefix = {\tokens}` (initially empty)

What is printed before the name (*e. g.*, k, M, ...).

`kind = iso|plural|name|symbol`

The representation of the monetary unit.

`cents = true|false|always`

Control the way the cents are printed.

`pre = true|false`

Select if the unit should be print before or after the value (only for ISO code and symbols).

`number = true|false`

Parse the values (interface to `parse-numbers` from `siunitx`).

`base = {\integer}`

Default: 2

Number of digits for the cents.

**Examples** No currency are actually defined in `currency`. Euros, US dollars, yens and pounds could be defined by

```

1 \DefineCurrency{EUR}{name={euro}, plural={euros}, symbol={\euro}, iso={
  EUR}, kind=iso}
2 \DefineCurrency{USD}{name={dollar}, plural={dollars}, symbol={\$}, iso
  ={USD}, kind=iso}
3 \DefineCurrency{JPY}{name={yen}, plural={yens}, symbol={\textyen}, iso
  ={JPY}, kind=iso, cents=false}
4 \DefineCurrency{GBP}{name={pound}, pre=true, plural={pounds}, symbol={\
  pounds}, iso={GBP}, kind=iso}

```

## 4 Using currencies

### 4.1 Using currencies

Currencies are used with or without amounts. They could also be changed locally.

`\CurrencySetup{\maps}`

This command defines a *style* in the sense of `pgfkeys`, that is a series of keys-values pairs. These maps are executed after the ones defining the format of the currency but before the optional argument passed to `\dXXX` or `\cXXX` where `XXX` is the ISO 4217 code of the currency. It could be used to change locally the setting of a currency. Using this command overrides the previous settings of `\CurrencySetup`. The command `\CurrencySetupAppend` append to the current style. The style is stored in `/currency/currency/.style`.

`\CurrencySetupAppend{⟨maps⟩}`

Similar to `\CurrencySetup` but append the style.

`\dXXX[⟨maps⟩]`

Print only the monetary unit with currency code `XXX`.

`\cXXX[⟨maps⟩]{⟨value⟩}`

Print the value with the monetary unit with currency code `XXX`.

## 4.2 How currencies are composed?

The commands `\cXXX` and `\dXXX` are expanded inside a group. The argument `⟨value⟩` for `\cXXX` is stored into `\value`. Besides, the unit is stored into `\currencyunit` according to the value of `kind`.

When using `\dXXX`, the order in which the elements are composed is

`font before prefix \currencyunit pre-between \value after`

when the currency unit is printed before (`pre=false`), and

`font before \value post-between prefix \currencyunit after`

otherwise (`pre=true`).

The rules are

- The value (mandatory argument) specified by `⟨value⟩` is printed using `\num{⟨value⟩}` using the `\num` command from `siunitx`, and the value is stored locally into `\value`.
- Both `prefix` and `unit` are enclosed into a `\text` command so that they could safely be used in math mode.

When using `\cXXX`, the order in which the elements are composed is

`font before prefix \currencyunit after`

where `prefix` and `\currencyunit` are enclosed in a `\text` command. The boolean option `pre` is useless in this case.

## 4.3 The hierarchy of keys definitions

The order in which the keys are defined (and then overwritten) is

- Default options values.
- Command `\DefineCurrency`.
- Command `\CurrencySetup`, which is a shorthand for defining the pgfkey `/currency/currency/.style`.
- Command `\cXXX` ou `\dXXX` (the commands are executed in a group).

## 4.4 Examples

### 4.4.1 Punctuation.

The commands `\dXXX` and `\cXXX` are defined using the `xparse` package. The space is preserved after the command so that there is no need to use `\` after a command.

```
1 The total gross salary is \dEUR{2000}. A part of \dEUR{1500} forms the
   net salary.
```

---

The total gross salary is 2000 EUR. A part of 1500 EUR forms the net salary.

### Using a prefix

```
1 The total cost of the project is \dEUR[prefix=M,kind=symbol]{0.5}.
```

---

The total cost of the project is 0.50 M€.

**Changing the base** Most of the currencies have *cents*, that is a monetary unit equal to 1/100 of the monetary unit. It is however possible to use another number of digits, either for special purposes, or for monetary units with other bases such as the Kuwaiti dinar which is decomposed in 1000 fils.

```
1 \DefineCurrency{KWD}{name={dinar},plural={dinars},symbol={KD},iso={KWD
   },kind=iso,base=3}
2 $\dUSD{1}=\dKWD{0.29963}$
```

---

1 USD = 0.300 KWD

**Changing the font** Using the `font = {\tokens}` key, it is possible to change the font which is used for the monetary units (remember that everything is enclosed into a group). When used in the currency definition and in `\CurrencySetup`, it is however superseded by any other `font = {\tokens}` key used in `\dXXX` (A similar result could be obtained with `before = {\tokens}`, which aims at putting some material). To avoid this, `font+ = {\tokens}` shall be used.

## 4 Using currencies

Numbers are typeset using an upright font. The `detect-...` options of `siunitx` could be used to change [Wri14, § 5.2]. However, they should be passed as boolean keys.

```
1 \textit{It costs \dUSD{1}}.  
2 \textit{It costs \dUSD[font=\normalfont]{1}}.  
3 \begin{empty}  
4 \CurrencySetup{font=\normalfont}  
5 \textit{It costs \dUSD{1}}.  
6 \textit{It costs \dUSD[font+=\bfseries]{1}}.  
7 \textit{It costs \dUSD[font=\bfseries]{1}}.  
8 \textit{It costs \dUSD[font=\bfseries,detect-weight=true]{1}}.  
9 \textit{It costs \dUSD[font=\bfseries,detect-all=true]{1}}.  
10 \end{empty}
```

---

*It costs 1 USD. It costs 1 USD. It costs 1 USD. It costs 1 USD. It costs 1 USD. It costs 1 USD. It costs 1 USD.*

**Using `before` and `after`** The use of `before = {\tokens}` is similar to the one of `font = {\tokens}`. It is possible to append or to prepend the value to existing ones defined at a higher level through `before+ = {\tokens}` and `before< = {\tokens}`. Similarly, one could use `after = {\tokens}`, `after+ = {\tokens}` and `after< = {\tokens}`.

```
1 \CurrencySetup{before=X}  
2 \dUSD[before+={\color{red}}]{1}  
3 \dUSD[before<={\color{red}}]{1}
```

---

**X1 USD X1 USD**

### 4.4.2 Using `siunitx`'s features

Any key of the `siunitx` package could be used. For example, localization may change the unit separator (comma, ...).

```
1 This costs \dEUR{12 345.76}.  
2 {\sisetup{locale=FR} Cela co\^ute \dEUR{12 345.76}.}
```

This costs 12 345.76 EUR. Cela coûte 12 345,76 EUR.

#### 4.4.3 Using styles

Some styles are already defined to shorten the typesetting. For example, `@iso` expands to `kind=iso`. It acts similarly for `@sy` (or `@symb`), `@na` (or `@name`) and `@pl` (or `@plural`).

```
1 \dEUR[@iso]{10}; \dEUR[@symb]{10}; \dEUR[@name]{10}; \dEUR[@pl]{10}
2
3 \dGBP{10} ; \dGBP[@symb]{10} ; \dGBP[@pl]{10} ; \dGBP{5}
```

---

10 EUR; 10 €; 10 euro; 10 euros  
GBP 10 ; £ 10 ; 10 pounds ; GBP 5

## 5 To Do

- Store the values to use them later.
- Automatic detection of plurals.
- Perform simple arithmetics.
- Behavior of `detect-...` keys from `siunitx` with default argument.
- Internationalization using the `translations` packages [Nie17].
- Non decimal systems such as pounds, shillings, and pence.
- Column definition for a table.
- ...

## References

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