The SIstyle package*

D.N.J. Els

(dnjels@sun.ac.za)

2008/07/16

Abstract

The SIstyle package provides macros to type numbers and units in a consistent way according to SI requirements. The following commands are provided:

`\SI{`⟨*number*⟩`}{`⟨*unit*⟩`}`	→	Setting numbers with units
`\num{`⟨*number*⟩`}`	→	Setting a number
`\ang{`⟨*degs*⟩`;`⟨*mins*⟩`;`⟨*secs*⟩`}`	→	Setting an angle

The requirements for formatting and typesetting of SI units and numbers listed in this document, were extracted verbatim from the *NIST Special Publication 811* (SP 811):

`http://physics.nist.gov/cuu/Units/rules.html`

It is not a full list of all the requirements, but only those relevant to font type and spacing formatting.

It is the responsibility of the user to use the correct units and prefixes, because the purpose of this package is only to typeset the SI units and numbers properly. It is therefore recommended that the user makes a thorough study of SP 811 or the equivalent specification for his or her country.

`SIstyle v2.3` is the final version of this package. No new features will be added in the future. The packages will be maintained and bugs will be fixed.

All future development will be done in the `siunitx` package.

*This file has version number v2.3a, last revised 2008/07/16.

Contents

Part 1

Using The SIstyle Package

1.1 Loading the SIstyle Package

The SIstyle package is loaded in the document preamble with

```
\usepackage{sistyle}
```

1.2 The Typesetting Commands

1.2.1 SI numbers with units

The `\SI` command typeset SI numbers with units and it conforms to the rules as given in Part 2.

`\SI{`⟨*number*⟩`}{`⟨*unit*⟩`}`

Inside the `\SI` command the point, ".", is make active and redefined to `\SIunitdot`. The hard space, "~", is redefined to `\SIunitspace`. This makes for convenient shorthand in that by typing `N.m` you obtain "N · m" or `N~m` gives "N m".

`\pnt`

The point can now not be used as a decimal point as part of a unit and the symbol `\pnt` is defined as substitute. It is however recommended to use the `\num` command to ensure uniform formatting of numbers.

Example:

`\SI{}{m.kg/(s^3.A)}`	→	$\mathrm{m \cdot kg/(s^3 \cdot A)}$
`\SI{}{(MPa)^{0\pnt 5}}`	→	$(\mathrm{MPa})^{0.5}$
`\SI{}{(MPa)^{\num{0.5}}}`	→	$(\mathrm{MPa})^{0{\cdot}5}$
`$v=\SI{10}{m.s^{-1}}$`	→	$v = 10\ \mathrm{m \cdot s^{-1}}$
`$v=\SI{10}{m/s}$`	→	$v = 10\ \mathrm{m/s}$
`$v=\SI{10}{\tfrac{m}{s}}$`	→	$v = 10\ \frac{\mathrm{m}}{\mathrm{s}}$
`$\tau=\SI{3}{N~m}$`	→	$\tau = 3\ \mathrm{N\,m}$

The numbers and units are set inside a math environment with an upright font. When the `\SI` command is used in normal text or inside inline maths, it follows the surrounding fonts. Display maths on the other hand will follow the active math fonts. When different text and math fonts are used, it can be problematic, because unit that are typed inside normal text will have a different font from the units inside display maths.

Example: The velocity is 15.3 m/s at the ...
The velocity is 15.3 m/s ***at the ...***
The velocity is 15.3 m/s at the ...
`The velocity is 15.3 m/s at the ...`

The typesetting of SI units obeys the surrounding bold text depending on the following switches:

`\SIobeyboldtrue`
`\SIobeyboldfalse` (default)

Example: `\SIobeyboldtrue` → ***The velocity is* 15.3 m/s *at the ...***
`\SIobeyboldfalse` → ***The velocity is*** 15.3 m/s ***at the ...***

1.2.2 Numbers

Numbers can be formatted with the `\num` command.

`\num{`⟨*decimal number*⟩`}`
`\num*{`⟨*decimal number*⟩`}`

Numbers may only consist of: "+ − 0 1 2 3 4 5 6 7 8 9 . , e E". The input decimal separator can be either a point "`.`" or a comma "`,`". The output is formatted according to the `\SIdecimalsign` setting. No thousand separators are allowed in the argument (spaces are ignored). "`E`x" or "`e`x" is converted to 10^x.

Example: `\num{1.2e3}` → 1.2×10^3
`\num{1,2E3}` → 1.2×10^3

The `\num` command simplifies the input of numbers and typeset them correctly.

Example:

`\num{E1.5}`	→	$10^{1.5}$
`\num{ - e -.5}`	→	$-10^{-0.5}$
`\num{+1e-.5}`	→	$+1 \times 10^{-0.5}$
`\num{1.23456e5}`	→	$1.234\,56 \times 10^5$
`\num{+1.234}`	→	$+1.234$
`\num{-.12345}`	→	$-0.123\,45$
`\num{1.}`	→	$1.$
`\num{1}`	→	1
`\num{123}`	→	123
`\num{1234}`	→	1234
`\num{12345}`	→	$12\,345$
`\num{-123456}`	→	$-123\,456$

The grouping of the four digits can be switched on or of — e.g., in a table — with the following switches :

`\SIgroupfourtrue` (default)
`\SIgroupfourfalse`

Please make sure that changes are kept local to ensure uniformity throughout a document.

Example:

`{\SIgroupfourtrue\num{1234.5678}}`	→	1234.5678
`{\SIgroupfourfalse\num{1234.5678}}`	→	$1\,234.567\,8$

The starred form, `\num*`, typeset the number in the normal active LaTeX font. This is needed when numbers are inserted in headings, etc. The unstarred version uses the same upright math font as the SI units.

Example: `\textit{There were \num{123} of them}` → *There were* 123 *of them*
`\textit{There were \num*{123} of them}` → *There were 123 of them*

1.2.3 Angles

The `\ang` command is supplied by the SIstyle package to typeset angles. Note the degrees, minutes and seconds are separated with a semi-colon "`;`".

`\ang{`⟨*degs*⟩`;`⟨*mins*⟩`;`⟨*secs*⟩`}`
`\ang{`⟨*decimal degrees*⟩`}`

Example:

`\ang{10}`	→	10°
`\ang{10; 12}`	→	$10^\circ 12'$
`\ang{10; 12; 4}`	→	$10^\circ 12' 4''$
`\ang{10; 12; 4,01}`	→	$10^\circ 12' 4.01''$
`\ang{; ; 4}`	→	$0^\circ 0' 4''$
`\ang{10.2011}`	→	10.2011°
`\ang{+10}`	→	$+10^\circ$
`\ang{-10}`	→	-10°

1.3 Additional Units Symbols

Most of the SI unit symbols are characters from the Latin alphabet, except for the few listed in table 1 and which are provided by the SIstyle package. Note that the commands are only provided if the user do not define the command in the preamble.

If the user redefines or supplies his own commands for units, than all the symbols must be available in math mode. For symbols that are only available in text mode, e.g., from the textcomp package, the symbol must be placed inside a `\mbox` command. The best way to define a new unit command is with the aid if the SIstyle internal command `\ensureupmath`.

Symbols available in math mode:

Example: `\newcommand*{\mps}{\ensureupmath{m/s}}`

which can be used in text and math mode

`\SI{10}{\mps}`	→	10.2 m/s
`The unit \mps\ ...`	→	The unit m/s ...
`$v/(\mps)=\num{10}$`	→	$v/(\mathrm{m/s}) = 10$

Symbols only available in text mode (textcomp)

Example:
```
\renewcommand*{\micro}{\ensureupmath{\mbox{\textmu}}}
\newcommand*{\microsec}{\ensureupmath{\micro s}}
```

which can be used in text and math mode

`\SI{5}{\micro s}`	→	5 µs
`The prefix \micro\ ...`	→	The prefix µ ...
`$t/\microsec =\num{5}$`	→	$t/\mu\mathrm{s} = 5$

Table 1: Additional SI symbols

Command	Symbol
`\angstrom`	Å
`\micro`[a]	μ
`\ohm`	Ω
`\degC`	°C
`\degF`[b]	°F
`\arcdeg`	°
`\arcmin`	′
`\arcsec`	″

NOTE: Contrary to the common practice in many countries, is the correct SI symbol for litre a capital L or lowercase l, and *not* the script l, ℓ (`\ell`).

[a] Some fonts have an upright Greek µ character available in the TS1 encoding (textcomp package). Fonts such as Lucida and Adobe Symbol also supply upright Greek math characters. See also the upgreek and gensymb packages.

[b] Not a standard SI symbol.

1.4 Configuring The Output

1.4.1 Configuring commands

The output of the `\SI` command can be formatted by the user by setting the following commands:

`\SIunitsep{`⟨*spacing cmd*⟩`}`	[default: `{\,}`]
`\SIunitspace{`⟨*spacing cmd*⟩`}`	[default: `{\,}`]
`\SIunitdot{`⟨*cmd*⟩`}`	[default: `{\cdot}`]

- The spacing between the number and the unit is set with `\SIunitsep`.
- Inside the `\SI` command the point, ".", is make active and redefined to `\SIunitdot`.
- The hard space, "~", is redefined to `\SIunitspace`.

The user can change the number format with the following commands:

`\SIdecimalsign{`⟨*cmd*⟩`}`	[default: `{.}`]
`\SIthousandsep{`⟨*spacing cmd*⟩`}`	[default: `{\,}`]
`\SIproductsign{`⟨*cmd*⟩`}`	[default: `{\times}`]

The default fonts to be selected by the SIstyle package can be changed. The following commands are provided:

`\SImathrm{`⟨*math font command*⟩`}`	[default: `{\mathrm}`]
`\SImathsf{`⟨*math font command*⟩`}`	[default: `{\mathsf}`]
`\SImathtt{`⟨*math font command*⟩`}`	[default: `{\mathtt}`]

- `\SImathrm`: Sets the default math serif font.
- `\SImathsf`: Sets the default math sanserif font.
- `\SImathtt`: Sets the default math typewriter font.

`\SIdefaultMfam{`⟨*math font command*⟩`}`	[default: `{\mathrm}`]
`\SIdefaultNfam{`⟨*math font command*⟩`}`	[default: `{\mathrm}`]
`\SIdefaultTfam{`⟨*text font family*⟩`}`	[default: `{\rmfamily}`]

- `\SIdefaultMfam`: Sets the default math font of the units.
- `\SIdefaultNfam`: Sets the default math font of the numbers.
- `\SIdefaultTfam`: Sets the default text font when text components are included with the units (e.g., from the textcomp package)

Note: An interesting side-effect can be obtained when you are using Computer Modern fonts by setting the `\SIdefaultNfam` to `\mathnormal`. The result is that all the numbers are then in lowercase: 0123456789 as oppose to 0123456789. This document was formatted with this setting.

1.4.2 Examples formats

USA: NIST Special Publication 811 – *Guide for the Use of the International System of Units (SI)*

```
\SIdecimalsign{.}
\SIthousandsep{\,}
\SIproductsign{\times}
\SIunitsep{\,}
\SIunitspace{\cdot}      (give ~ and . the same output)
\SIunitdot{\cdot}
```

This will format a number and unit:

`\SI{-1.23456e^3}{N.m}` → $-1.234\,56 \times 10^{3}\ \mathrm{N \cdot m}$

To obtain tighter numbers, put the multiplication and half high dot signs inside braces

```
\SIproductsign{{\times}}
\SIunitspace{{\cdot}}
\SIunitdot{{\cdot}}
```

This will then format the number and unit:

`\SI{-1.23456e^3}{N.m}` → $-1.234\,56\times10^{3}$ N·m

1.5 Locales

The SIstyle package provides a number of style setup commands for the formatting conventions in different countries (or your own pivate setting).

`\AddToSIstyle {`⟨*locale*⟩`}`
`\AddToSIstyle*{`⟨*locale*⟩`}`

`\SIstyle{`⟨*locale*⟩`}`

`\SIstyleToLang{`⟨*language*⟩`}{`⟨*locale*⟩`}`

The `\AddToSIstyle` appends formatting commands to a locale. The starred form clears the list before appending. As an example for the USA (see §1.4.2)

```
\AddToSIstyle{USA}{%
   \SIdecimalsign{.}%
   \SIthousandsep{\,}%
   \SIunitsep{\,}%
   \SIunitdot{\cdot}%
   \SIunitspace{\;}%
   \SIproductsign{\times}%
   \SIobeyboldfalse
   \SIgroupfourtrue}
```

See table 2 for a list of predefined settings.[1] A predefined setting can then be activated with the `\SIstyle` command, for example:

```
\SIstyle{USA}
```

Locales can also be linked to the language setup commands of babel with the `\SIstyleToLang` command, for example:

```
\SIstyleToLang{english}{USA}
```

The settings of `USA` will then be activated every time babel makes `english` the active languge. This command is provided because a number formatting are not linked to languages (nearly every English speaking country has a different number format).

1.6 Other packages

1.6.1 textcomp

The SIstyle package defines a number of unit symbols that are not available as standard characters. If the textcomp package is loaded, the symbols in the righthand column of table 3 automatically used.

[1] Any contribution shall be appreciated.

Table 2: Predefined styles

Style		**Locale**	**Example**
Germany		`German`	$-1{,}234\,56 \cdot 10^{3}\ \mathrm{N \cdot m}$
South Africa	(SABS M 33a:1992)	`S-Africa`	$-1{,}234\,56 \times 10^{3}\ \mathrm{N \cdot m}$
USA	(NIST SP811)	`USA`	$-1.234\,56 \times 10^{3}\ \mathrm{N \cdot m}$

Table 3: SI symbols defined by textcomp package

Command	Symbol	textcomp
`\angstrom`	Å	Å
`\micro`	μ	µ
`\ohm`	Ω	Ω
`\degC`	°C	℃
`\degF`	°F	℉
`\arcdeg`	°	°

1.6.2 SIunits

The SIunits package provides commands for all the SI units and prefixes. It can be used together with SIstyle, but care must be taken to ensure that both the packages have identical configurations.

Example:

```
\usepackage{textcomp}
\usepackage[cdot,textstyle]{SIunits}
   \let\ohm\relax
\usepackage{sistyle}
   \SIunitspace{\cdot}
   \SIunitdot{\cdot}
```

Inside the document SIunits can then be used as

`\SI{30}{\watt\per\square\metre\usk\kelvin}` → $30\ \mathrm{W/m^2 \cdot K}$

As the author of SIunits, I prefere to write

`\SI{30}{W/m^2.K}` → $30\ \mathrm{W/m^2 \cdot K}$

1.6.3 mathcomp

The mathcomp package provided the textcomp symbols in math mode. Unfortunately it is only available in the `\mathrm` math alphabet and is therefore of little use to SIstyle.

1.6.4 upgreek

The upgreek package can be used to redefine the `\micro` and `\ohm` commands.

Example:

```
\usepackage{sistyle}
\usepackage[Euler]{upgreek}
   \newcommand*{\micro}{\ensureupmath{\upmu}}
   \newcommand*{\ohm}{\ensureupmath{\upOmega}}
```

1.6.5 gensymb

The gensymb package provides generic commands `\degree`, `\celsius`, `\perthousand`, `\micro` and `\ohm` which work both in text and math mode. Note that SIstyle typeset all its symbols in math mode which will cause gensymb to provide only math symbols. The result is that only the `\mathrm` versions of the symbols are then output in a document, thereby ignoring the font changing mechanism of SIstyle.

1.6.6 arev

The arev sanserif font has a slanted math sanserif font. To get an upright math font the `\mathrm` font must be used in place of `\mathsf`. The package textcomp is included inside arev, but it do not give the proper symbol for arev. We can use the `\textmu` symbol from the BeraSans typewriter font loaded internaly by arev

Example:

```
\usepackage{arev}
\usepackage{sistyle}
   \SImathsf{\mathrm}
   \SIdefaultTfam{\sffamily}
   \newcommand*{\micro}{\ensureupmath{\text{\ttfamily\textmu}}}
   \newcommand*{\ohm}{\ensureupmath{\Omega}}
   \newcommand*{\degC}{\ensureupmath{{}^{\circ}\kern-\scriptspace C}}
   \newcommand*{\degF}{\ensureupmath{{}^{\circ}\kern-\scriptspace F}}
```

Part 2

Typesetting SI Units

2.1 SI Units

2.1.1 Typeface

Unit symbols are printed in normal roman (upright) type regardless of the type used in the surrounding text.

Example: ***A torque of*** $10\ \mathrm{N \cdot m}$ ***was applied.***

Listing:
```
{\bfseries\itshape A torque of\/ \SI{10}{N.m} was applied.}
```

2.1.2 Unit symbols obtained by multiplication

Symbols for units formed from other units by multiplication are indicated by means of either a half-high (that is, centered) dot or a space. However, the half-high dot is preferred, because it is less likely to lead to confusion.

Example: $\mathrm{N\,m}$ or $\mathrm{N \cdot m}$

Listing:
```
\SI{}{N~m} or \SI{}{N.m}
```

Notes:

(a) A half-high dot or space is usually imperative. For example, $\mathrm{m \cdot s^{-1}}$ is the symbol for the metre per second while $\mathrm{ms^{-1}}$ is the symbol for the reciprocal millisecond ($1 \times 10^3\ \mathrm{s^{-1}}$).

(b) The ISO 31-0 specification suggests that if a space is used to indicate units formed by multiplication, the space may be omitted if it does not cause confusion. This possibility is reflected in the common practice of using the symbol kWh rather than $\mathrm{kW \cdot h}$ or $\mathrm{kW\,h}$ for the kilowatt hour. Nevertheless, is the position taken that a half-high dot or a space should always be used to avoid possible confusion; and that for this same reason, only one of these two allowed forms should be used in any given manuscript.

2.1.3 Unit symbols obtained by division

Symbols for units formed from other units by division are indicated by means of a solidus (oblique stroke, `/`), a horizontal line, or negative exponents.

Example: $\mathrm{m/s}$, $\dfrac{\mathrm{m}}{\mathrm{s}}$, or $\mathrm{m \cdot s^{-1}}$

Listing:
```
\SI{}{m/s}, \SI{}{\dfrac{m}{s}}, or \SI{}{m.s^{-1}}
```

However, to avoid ambiguity, the solidus must not be repeated on the same line unless parentheses are used.

Examples: $\mathrm{m/s^2}$ or $\mathrm{m \cdot s^{-2}}$ *but not:* $\mathrm{m/s/s}$
$\mathrm{m \cdot kg/(s^3 \cdot A)}$ or $\mathrm{m \cdot kg \cdot s^{-3} \cdot A^{-1}}$ *but not:* $\mathrm{m \cdot kg/s^3/A}$

Listing:
```
\SI{}{m.kg/(s^3.A)} or \SI{}{m.kg.s^{-3}.A^{-1}}
```

Negative exponents should be used in complicated cases.

2.2 Rules for Expressing Values of Quantities

2.2.1 Value and numerical value of a quantity

The *value* of a quantity is its magnitude expressed as the product of a number and a unit, and the number multiplying the unit is the *numerical* value of the quantity expressed in that unit.

More formally, the value of quantity A can be written as $A=\{A\}[A]$, where $\{A\}$ is the numerical value of A when the value of A is expressed in the unit $[A]$. The numerical value can therefore be written as $\{A\}=A/[A]$, which is a convenient form for use in figures and tables. Thus, to eliminate the possibility of misunderstanding, an axis of a graph or the heading of a column of a table can be labeled "$t/℃$" instead of "t (℃)" or "Temperature (℃)."

Example:

(a) In the SI, the value of the velocity of light in vacuum is $c = 299\,792\,458$ m/s exactly. The number $299\,792\,458$ is the numerical value of c when c is expressed in the unit m/s, and equals $c/(\mathrm{m/s})$.

Listing:
```
$c = \SI{299792458}{m/s}$
$c/(\SI{}{m/s})$
```

(b) The ordinate of a graph is labeled $t/\mu s$, where t is the symbol for time and s is the unit symbol for second, and has scale marks at 0, 4, 8, and 12. If the ordinate value of a point on a curve in the graph is estimated to be 3.2, the corresponding time is $t/\mu s = 3.2$ or $t = 3.2\ \mu s = 3.6 \times 10^{-6}$ s. Notice the lack of ambiguity in this form of labelling compared with "Time (μs)." See figures 1 and 2 for examples.

(c) An expression such as $\ln(p/\mathrm{MPa})$, where p is the quantity symbol for pressure and MPa is the unit symbol for megapascal, is perfectly acceptable because

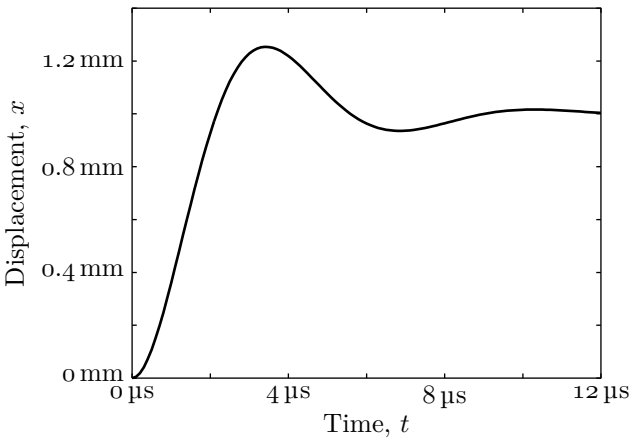

Figure 1: Units included with the scale of the graph. This form is usually difficult to obtain with most graphing software.

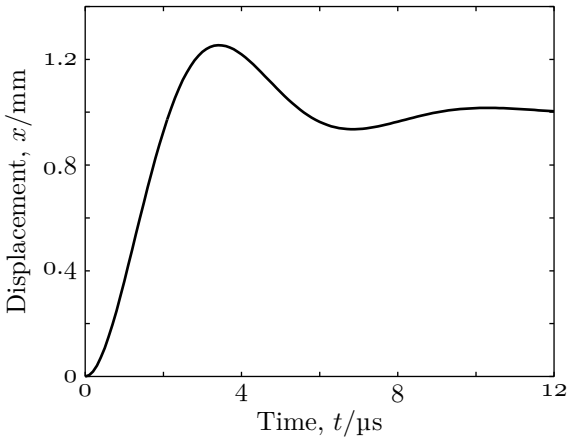

Figure 2: The graph labels includes the units and the scales are dimensionless. Notice that there is no ambiguity with this form of labeling, because everything makes mathematical sense.

p/MPa is the numerical value of p when p is expressed in the unit MPa and is simply a number.

Listing: `$\ln(p/\SI{}{MPa})$`

Notes:

(a) For the conventions concerning the grouping of digits, see section §2.3.3.

(b) An alternative way of writing $c/(\mathrm{m/s})$ is $\{c\}_{\mathrm{m/s}}$, meaning the numerical value of c when c is expressed in the unit m/s.

Listing: `$\{c\}_{\SI{}{m/s}}$`

2.2.2 Space between numerical value and unit symbol

In the expression for the value of a quantity, the unit symbol is placed after the numerical value and a *space* is left between the numerical value and the unit symbol. Note that this rule includes the persentage sign %.

The only exceptions to this rule are for the unit symbols for degree, minute, and second for plane angles: °, ′, and ″, respectively, in which case no space is left between the numerical value and the unit symbol.

Examples: $x = 10\ \mathrm{mm}$
$q = 25\ \%$
$\theta = 30^\circ 22' 8''$

Listing:
```
$x = \SI{10}{mm}$
$q = \SI{25}{\%}$
$\theta = \ang{30;22;8}$
```

This rule means that:

(a) The symbol ℃ for the degree Celsius is preceded by a space when one expresses the values of Celsius temperatures.

Example: $t = 30.2\ ℃$ *but not:* $t = 30.2℃$ or $t = 30.28^\circ\ \mathrm{C}$

Listing: `$t = \SI{30.2}{\degC}$`

(b) Even when the value of a quantity is used in an adjectival sense, a space is left between the numerical value and the unit symbol. (This rule recognizes that unit symbols are not like ordinary words or abbreviations but are mathematical entities, and that the value of a quantity should be expressed in a way that is as independent of language as possible.)

Examples: a 1 m end gauge *but not:* a 1-m end gauge
a 10 kV resistor *but not:* a 10-kV resistor

However, if there is any ambiguity, the words should be rearranged accordingly. For example, the statement "the samples were placed in 22 mL vials" should be replaced with the statement "the samples were placed in vials of volume 22 mL."

Note: When unit names are spelled out, the normal rules of English apply. Thus, for example, "a roll of 35-millimetre film" is acceptable.

2.2.3 Clarity in writing values of quantities

The value of a quantity is expressed as the product of a number and a unit (see section §2.2.1). Thus, to avoid possible confusion, this *Guide* takes the position that values of quantities must be written so that it is completely clear to which unit symbols the numerical values of the quantities belong. Also to avoid possible confusion, this *Guide* strongly recommends that the word "to" be used to indicate a range of values for a quantity instead of a range dash (that is, a long hyphen) because the dash could be misinterpreted as a minus sign. (The first of these recommendations once again recognizes that unit symbols are not like ordinary words or abbreviations but are mathematical entities — see section §2.2.1.)

Examples:

$51\ \text{mm} \times 51\ \text{mm} \times 25\ \text{mm}$	*but not:*	$51 \times 51 \times 25\ \text{mm}$
$225\ \text{nm}$ to $2400\ \text{nm}$ or $(225$ to $2400)\ \text{nm}$	*but not:*	225 to $2400\ \text{nm}$
$0\ ^\circ\text{C}$ to $100\ ^\circ\text{C}$ or $(0$ to $100)\ ^\circ\text{C}$	*but not:*	$0\ ^\circ\text{C} - 100\ ^\circ\text{C}$
$0\ \text{V}$ to $5\ \text{V}$ or $(0$ to $5)\ \text{V}$	*but not:*	$0 - 5\ \text{V}$
$(8.2, 9.0, 9.5, 9.8, 10.0)\ \text{GHz}$	*but not:*	$8.2, 9.0, 9.5, 9.8, 10.0\ \text{GHz}$
$63.2\ \text{m} \pm 0.1\ \text{m}$ or $(63.2 \pm 0.1)\ \text{m}$	*but not:*	$63.2 \pm 0.1\ \text{m}$ or $63.2\ \text{m} \pm 0.1$
$129\ \text{s} - 3\ \text{s} = 126\ \text{s}$ or $(129 - 3)\ \text{s} = 126\ \text{s}$	*but not:*	$129 - 3\ \text{s} = 126\ \text{s}$

Note: For the conventions concerning the use of the multiplication sign, see section §2.3.4.

2.3 Printing Numbers

2.3.1 Typeface for numbers

Arabic numerals expressing the numerical values of quantities are generally printed in lightface (that is, regular) roman type irrespective of the type used for the surrounding text. Arabic numerals other than numerical values of quantities may be printed in lightface or bold italics, or in bold roman type, but lightface roman type is usually preferred.

2.3.2 Decimal sign or marker

The sign or marker being used depends very much on the practices of a country (and/or language), e.g., in the United States is the dot on the line, while in Germany it is the comma.

For numbers less than one, a zero is written before the decimal marker. For example, $0.25\ \text{s}$ is the correct form, not $.25\ \text{s}$.

2.3.3 Grouping digits

Because the comma is widely used as the decimal marker, it should not be used to separate digits into groups of three (there are exceptions for certain countries). Instead, digits should be separated into groups of three, counting from the decimal marker towards the left and right, by the use of a thin, fixed space. However, this

practice is not usually followed for numbers having only four digits on either side of the decimal marker except when uniformity in a table is desired.

Examples:	76 483 522	*but not:*	76,483,522
	43 279.168 29	*but not:*	43,279.168 29
	8012 or 8 012	*but not:*	8,012
	0.491 722 3	*is highly preferred to:*	0.4917223
	0.5947 or 0.594 7	*but not:*	0.59 47
	8012.5947 or 8 012.594 7	*but not:*	8 012.5947 or 8012.594 7

Note: The practice of using a space to group digits is not usually followed in certain specialized applications, such as engineering drawings and financial statements.

2.3.4 Multiplying numbers

When the dot is used as the decimal marker (USA convention), the preferred sign for the multiplication of numbers or values of quantities is a cross (that is, multiplication sign) (×), not a half-high (that is, centered) dot (·).

Examples:	25×60.5	*but not:*	$25 \cdot 60.5$
	$53\ \mathrm{m/s} \times 10.2\ \mathrm{s}$	*but not:*	$53\ \mathrm{m/s} \cdot 10.2\ \mathrm{s}$
	$15 \times 72\ \mathrm{kg}$	*but not:*	$15 \cdot 72\ \mathrm{kg}$

Notes:

(a) When the comma is used as the decimal marker, the preferred sign for the multiplication of numbers is the half-high dot (German convention).

$3{,}645\ 98 \cdot 10^2$ or $2{,}58 \cdot 31{,}2$

The comma is also used together with the cross for the multiplication of values of quantities (South African Convention).

$3{,}645\ 98 \times 10^2$ or $2{,}58 \times 31{,}2$

(b) The multiplication of quantity symbols (or numbers in parentheses or values of quantities in parentheses) may be indicated in one of the following ways: ab, $a\ b$, $a \cdot b$, $a \times b$.

Part 3

Implementation: SIstyle

```
1 ⟨*package⟩
```

3.1 Utilities

We need the `\text` command from the $\mathcal{AMS}$ package amstext for the typesetting of text in math mode.

```
2 \RequirePackage{amstext}
```

3.1.1 Test for ε-TEX

```
3 \newif\ifSI@eTeX
4 \SI@eTeXfalse
5 \ifx\eTeXversion\@undefined
6 \else
7   \ifx\eTeXversion\relax
8   \else
9     \ifnum\eTeXversion>\z@
10      \SI@eTeXtrue
11    \fi
12  \fi
13 \fi
```

3.1.2 Test for empty argument

`\SI@ifempt` Test for a empty argument (Wilson, Arseneau in ifmtarg.sty).
Usage: `\SI@ifempt{`⟨*arg*⟩`}{`⟨*true*⟩`}{`⟨*false*⟩`}`

```
14 \begingroup
15   \catcode`\Q=3
16   \long\gdef\SI@ifempt#1{\SI@xifempt#1QQ\@secondoftwo\@firstoftwo\@nil}
17   \long\gdef\SI@xifempt#1#2Q#3#4#5\@nil{#4}
18 \endgroup
```

3.1.3 Font test commands

`\GetMathFontFams` There exists no hook to test for the current active math font. Get the different families at the beginning of the document. We only look for `\mathsf` and `\mathtt`. The others are set with the default math font (`\mathrm`).

```
19 \newcommand{\GetMathFontFams}{%
20    \sbox{0}{$%
21       \@ifundefined{mathsf}
22          {\global\chardef\SI@sffam=99}%
23          {\mathsf{\global\chardef\SI@sffam=\fam}}%
24       \@ifundefined{mathtt}
25          {\global\chardef\SI@ttfam=99}%
26          {\mathtt{\global\chardef\SI@ttfam=\fam}}%
27       $}%
28  }

29 \AtBeginDocument{\GetMathFontFams}
```

\IfTbold Test if bold text (\bfseries or \bxseries) is active.
Usage: \IfTbold{⟨*true*⟩}{⟨*false*⟩}

```
\newcommand{\IfTbold}[2]{%
   \if b\expandafter\@car\f@series\@nil%
      #1\else #2\fi}
```

\IfMbold Test if \boldmath is active. Usage: \IfMbold{⟨*true*⟩}{⟨*false*⟩}

```
\newcommand{\IfMbold}[2]{%
   \edef\temp@bm{bold}%
   \ifx\math@version\temp@bm
      #1\else #2\fi}
```

3.1.4 Font user setup commands

\SIobeybold User flag to obey bold text and math bold setting for SI units and numbers.

```
\newif\ifSIobeybold
\SIobeyboldfalse
```

\SI@mathrm
\SI@mathsf
\SI@mathtt
\SImathrm
\SImathsf
\SImathtt
Make user commands to override \mathrm, \mathsf and \mathtt,

```
\newcommand*{\SI@mathrm}{\mathrm}
\newcommand*{\SI@mathsf}{\mathsf}
\newcommand*{\SI@mathtt}{\mathtt}
\newcommand*{\SImathrm}[1]{\renewcommand*{\SI@mathrm}{#1}}
\newcommand*{\SImathsf}[1]{\renewcommand*{\SI@mathsf}{#1}}
\newcommand*{\SImathtt}[1]{\renewcommand*{\SI@mathtt}{#1}}
```

\SIdefaultMfam
\SI@defaultMfam
The default upright math font for typesetting SI units. This is normally the \mathrm command, but the user may select a different font.

```
\newcommand*{\SI@defaultMfam}{\SI@mathrm}
\newcommand*{\SIdefaultMfam}[1]{\renewcommand*{\SI@defaultMfam}{#1}}
```

\SIdefaultNfam
\SI@defaultNfam
The default upright math font for typesetting numbers. This is normally the \mathrm command, but the user may select a different font, for example \mathnormal to obtain old-style digits.

```
\newcommand*{\SI@defaultNfam}{\SI@mathrm}
\newcommand*{\SIdefaultNfam}[1]{\renewcommand*{\SI@defaultNfam}{#1}}
```

\SIdefaultTfam
\SI@defaultTfam
The default text font for units set inside a \mbox, such as symbols from the textcomp package. It sets the font when the surrounding text font is not \sffamily or \ttfamily or if it is set inside display math.

```
\newcommand*{\SI@defaultTfam}{\rmfamily}
\newcommand*{\SIdefaultTfam}[1]{\renewcommand*{\SI@defaultTfam}{#1}}
```

\SIupmath This command set units and numbers in an upright font. When called inside a normal text paragraph or inside inline math $...$, it will follow the surrounding text font: sansserif or typewrite otherwise it will default to the roman font. Inside display math it will follows the active math font.

The prerequisite to toggle the \boldmath math version results in setting the argument inside the $\mathcal{AMS}$ \text command. It has the added benefit of scaling with the active math style.

Usage: \SIupmath[⟨*math font*⟩]{⟨*argument*⟩}

`\ifupmath` Flag to indicate whether we are inside `\SIupmath`.

```
\newif\ifupmath
\upmathfalse
\newcommand*{\SIupmath}[2][\SI@defaultMfam]{%
\begingroup
   \upmathtrue
   \edef\temp@sf{\sfdefault}%
   \edef\temp@tt{\ttdefault}%
   \let\SI@bold=\relax
   \ifmmode
      \ifdim\displaywidth>0pt\relax%--- DISPLAY MATH ------------
         \ifnum\the\fam=\SI@sffam
            \let\SI@mfam=\SI@mathsf
            \let\SI@tfam=\sffamily
         \else \ifnum\the\fam=\SI@ttfam
            \let\SI@mfam=\SI@mathtt
            \let\SI@tfam=\ttfamily
         \else
            \let\SI@mfam=#1%
            \let\SI@tfam=\SI@defaultTfam
         \fi\fi
         \IfMbold{\def\SI@bold{\bfseries}}%
                 {\def\SI@bold{\mdseries}}%
      \else%--- INLINE MATH ----------
         \ifx\f@family\temp@sf
            \let\SI@mfam=\SI@mathsf
            \let\SI@tfam=\sffamily
         \else\ifx\f@family\temp@tt
            \let\SI@mfam=\SI@mathtt
            \let\SI@tfam=\ttfamily
         \else
            \let\SI@mfam=#1%
            \let\SI@tfam=\SI@defaultTfam
         \fi\fi
         \IfTbold{\def\SI@bold{\boldmath}}%
                 {\def\SI@bold{\unboldmath}}%
      \fi
   \else%----- NORMAL TEXT --------------
      \ifx\f@family\temp@sf
         \let\SI@mfam=\SI@mathsf
         \let\SI@tfam=\sffamily
      \else\ifx\f@family\temp@tt
         \let\SI@mfam=\SI@mathtt
         \let\SI@tfam=\ttfamily
      \else
         \let\SI@mfam=#1%
         \let\SI@tfam=\SI@defaultTfam
      \fi\fi
      \IfTbold{\def\SI@bold{\boldmath}}%
              {\def\SI@bold{\unboldmath}}%
   \fi%----- END OF TEST --------------
   \text{%
      \ifSIobeybold\SI@bold\else\unboldmath\mdseries\fi
      \upshape\SI@tfam
```

```
      $\SI@mfam{#2}$}%
\endgroup
\check@mathfonts}
```

`\ensureupmath` A user command to use the `\SIupmath` command.

```
\DeclareRobustCommand{\ensureupmath}{%
   \ifupmath
      \expandafter\@firstofone
   \else
      \expandafter\SIupmath
   \fi}
```

3.2 Typeset Numbers

3.2.1 Setup for typesetting numbers

`\SIdecimalsign` `\SI@decsign` User command to set decimal sign.

```
\newcommand*{\SI@decsign}{{.}}
\newcommand*{\SIdecimalsign}[1]{\renewcommand*{\SI@decsign}{{#1}}}
```

`\SIthousandsep` `\SI@thousandsep` User command to set thousands separator.

```
\newcommand*{\SI@thousandsep}{{\,}}
\newcommand*{\SIthousandsep}[1]{\renewcommand*{\SI@thousandsep}{{#1}}}
```

`\SIproductsign` `\SI@prod` User command to set product sign.

```
\newcommand*{\SI@prod}{\ensuremath{{}\times{}}}
\newcommand*{\SIproductsign}[1]{\renewcommand*{\SI@prod}{\ensuremath{{}#1{}}}}
```

`\ifSIgroupfour` User flag for the grouping of four digits.

```
\newif\ifSIgroupfour
\SIgroupfourtrue
```

3.2.2 Number parser

`\SI@num` Main command for typesetting numbers. Zap all input spaces and make E's lowercase.

```
\def\SI@num#1{%
   \SI@ifempt{#1}{}{%
      \edef\SI@tmpa{\lowercase{\noexpand\SI@@num{\zap@space#1 \@empty}}}%
      \SI@tmpa}}
```

`\SI@@num` `\SI@numsplit` Split of the exponential part (Downes, Oberdiek on c.t.t)

```
\def\SI@@num#1{\SI@numsplit#1ee\SI@numexp\SI@realp\@empty}
\def\SI@numsplit#1e#2e#3#4#5{#4{#1}{#2}}
```

`\SI@p@tst` `\SI@m@tst` Temporaries to test for + and −.

```
\def\SI@p@tst{+}
\def\SI@m@tst{-}
```

`\SI@numexp` Type the exponent if the argument contains an "E" or "e".

```
\def\SI@numexp#1#2{%
   \SI@ifempt{#1}{}{%
```

```
      \def\SI@tmpb{#1}%
      \ifx\SI@tmpb\SI@p@tst\ensuremath{+}\else
      \ifx\SI@tmpb\SI@m@tst\ensuremath{-}\else
         \SI@realp{#1}{}\SI@prod%
      \fi\fi}%
   \ifmmode
     10^{\SI@realp{#2}{}}%
   \else
     10\textsuperscript{\SI@realp{#2}{}}%
   \fi}
```

`\SI@realp` `\SI@realpsplit` Split of the integer and decimal part (for decimal point).

```
\def\SI@realp#1#2{\SI@realpsplit#1..\SI@realfrc\SI@realc\@empty}
\def\SI@realpsplit#1.#2.#3#4#5{#4{#1}{#2}}
```

`\SI@realc` `\SI@realcsplit` Split of the integer and decimal part (for decimal comma).

```
\def\SI@realc#1#2{\SI@realcsplit#1,,\SI@realfrc\SI@signedint\@empty}
\def\SI@realcsplit#1,#2,#3#4#5{#4{#1}{#2}}
```

`\SI@realfrc` Type the number if it contains a fraction part. Insert a zero if the integer is empty (no sign either).

```
\def\SI@realfrc#1#2{%
   \SI@ifempt{#1}{\SI@int{0}}%
                 {\SI@signedint{#1}{}}%
   \SI@decsign\SI@dec{#2}}
```

`\SI@signedint` Split the plus and minus from the integer.

```
\def\SI@signedint#1#2{\SI@@signedint#1 }
\def\SI@@signedint#1#2 {%
  \if +#1\ensuremath{+}%
      \SI@ifempt{#2}{\SI@int{0}}{\SI@int{#2}}%
  \else
  \if -#1\ensuremath{-}%
      \SI@ifempt{#2}{\SI@int{0}}{\SI@int{#2}}%
  \else
  \SI@int{#1#2}\fi \fi}
```

`\SI@not@v` `\SI@@not@v` Test for a fifth digit.

```
\def\SI@not@v#1{\SI@@not@v#1\@empty\@empty\@empty\@empty\@empty\@nil}
\def\SI@@not@v#1#2#3#4#5\@nil{%
   \ifx\@empty#5\@empty
      \expandafter\@firstoftwo
   \else
      \expandafter\@secondoftwo
   \fi}
```

`\SI@int` Set the integer. If `\ifSIgroup` is true and the number has four or less digits, then set the number. Otherwise pass it on to the formatting command.

```
\def\SI@int#1{%
   \ifSIgroupfour
      \SI@not@v{#1}{#1}{\SI@intfmt{}#1\@empty\@empty\@empty}%
   \else
      \SI@intfmt{}#1\@empty\@empty\@empty%
   \fi}
```

\SI@intfmt
\SI@intfmtafterfi
\SI@addthousandsep

Finally typeset the integer in groups of three. (From a macro to typeset Dollar amounts by Donald Arseneau on c.t.t.)

```
\def\SI@intfmt#1#2#3#4{%
  \ifx\@empty#2\@empty%
    \SI@addthousandsep#1\relax
  \else
    \ifx\@empty#3\@empty%
      \SI@addthousandsep\@empty\@empty#1#2\relax
    \else
      \ifx\@empty#4\@empty%
        \SI@addthousandsep\@empty#1#2#3\relax
      \else
        \SI@intfmtafterfi{#1#2#3#4}%
      \fi
    \fi
  \fi}
\def\SI@intfmtafterfi#1\fi\fi\fi{\fi\fi\fi\SI@intfmt{#1}}
\def\SI@addthousandsep#1#2#3#4{#1#2#3%
  \if\relax#4\relax
  \else
    \SI@thousandsep\expandafter\SI@addthousandsep\expandafter#4%
  \fi}
```

\SI@dec
\SI@decfmt

Set the decimal part (from frenchb.ldf by by Johannes L. Braams)

```
\def\SI@dec#1{%
   \ifSIgroupfour
      \SI@not@v{#1}{#1}{\SI@decfmt#1\@empty\@empty\@empty\@empty}%
   \else
      \SI@decfmt#1\@empty\@empty\@empty\@empty%
   \fi}
\def\SI@decfmt#1#2#3#4{#1#2#3%
  \ifx\@empty#4\@empty%
  \else
    \SI@thousandsep\expandafter\SI@decfmt\expandafter#4%
  \fi}
```

3.2.3 Number commands

\SInum

Command to typeset a number in upright math font with \SIupmath

```
\newcommand*{\SInum}[1]{{%
   \let\SI@unitdot=\pnt%
   \SIupmath[\SI@defaultNfam]{\SI@num{#1}}}}
```

\num

The robust user command to typeset a number. The starred form gives a number in the normal active font.

```
\DeclareRobustCommand*{\num}{\@ifstar{\SI@num}{\SInum}}
```

3.3 Typesetting Angles

\ang
\SI@ang
\SI@@ang
\SI@ang@xii
\SI@@ang@xii
\SI@ang@xiii
\SI@@ang@xiii

The robust user command to typeset angles. Note that we have to make provisions for packages such as French that make the semicolon (;) active

```
\ifSI@eTeX
    \DeclareRobustCommand{\ang}{%
        \begingroup
            \catcode`;=12\relax
            \catcode`@=11\relax
            \SI@ang}
    \def\SI@ang#1{%
            \scantokens{\SI@@ang#1;;;\@nil}%
        \endgroup}
    \def\SI@@ang#1;#2;#3;#4\@nil{%
        \SI@@@ang{#1}{#2}{#3}}%
\else
    \DeclareRobustCommand{\ang}[1]{%
        \@nameuse{SI@ang@\romannumeral\catcode`\;}{#1}}%
    \begingroup
        \catcode`\;=12\relax
        \gdef\SI@ang@xii#1{\SI@@ang@xii#1;;;\@nil}
        \gdef\SI@@ang@xii#1;#2;#3;#4\@nil{\SI@@@ang{#1}{#2}{#3}}
        \catcode`\;=\active\relax
        \gdef\SI@ang@xiii#1{\SI@@ang@xiii#1;;;\@nil}
        \gdef\SI@@ang@xiii#1;#2;#3;#4\@nil{\SI@@@ang{#1}{#2}{#3}}
    \endgroup
\fi
```

`\SI@degs` `\SI@mins` `\SI@secs` `\SI@@@ang` Scratch commands to hold definitions and typeset angles.

```
\let\SI@degs=\relax
\let\SI@mins=\relax
\let\SI@secs=\relax

\newcommand*{\SI@@@ang}[3]{{%
   \SI@ifempt{#3}{}{\def\SI@secs{\SInum{#3}\SIupmath{\arcsec}}%
                    \def\SI@mins{\SInum{0}\SIupmath{\arcmin}}%
                    \def\SI@degs{\SInum{0}\SIupmath{\arcdeg}}}%
   \SI@ifempt{#2}{}{\def\SI@mins{\SInum{#2}\SIupmath{\arcmin}}%
                    \def\SI@degs{\SInum{0}\SIupmath{\arcdeg}}}%
   \SI@ifempt{#1}{}{\def\SI@degs{\SInum{#1}\SIupmath{\arcdeg}}}%
   \SI@degs\SI@mins\SI@secs}}
```

3.4 Typesetting Units

3.4.1 Unit setup commands

`\SIunitsep` `\SI@unitsep` User command to set unit separation width from the number.

```
\newcommand*{\SI@unitsep}{\,}
\newcommand*{\SIunitsep}[1]{\renewcommand*{\SI@unitsep}{#1}}
```

`\SIunitspace` `\SI@unitspace` User command to set the spacing between units when "~" is issued.

```
\newcommand*{\SI@unitspace}{\,}
\newcommand*{\SIunitspace}[1]{\renewcommand*{\SI@unitspace}{#1}}
```

`\SIunitdot` `\SI@unitdot` User command to set the unit dot when "." is given between units.

```
\newcommand*{\SI@unitdot}{{\cdot}}
\newcommand*{\SIunitdot}[1]{\renewcommand*{\SI@unitdot}{#1}}
```

\pnt Supply \pnt command for "." in mathmode. Define the point "." as a command when active (\mathcode`.="8000) inside math environment.

```
\DeclareMathSymbol{\pnt}{\mathord}{letters}{58}   %(\pnt = .)
{\catcode`\.=13 \gdef.{\SI@unitdot}}
```

3.4.2 Commands for units

\SIunit Command that sets the environment for typesetting units. The "." is made active and the "~" is redefined.

```
\newcommand*{\SIunit}[1]{%
\begingroup%
    \mathcode`.="8000%
    \def~{\SI@unitspace}%
    \SIupmath{#1}%
\endgroup}
```

\SI Command to typeset numbers with units.
Usage: \SI{⟨*number*⟩}{⟨*unit*⟩}

```
\DeclareRobustCommand*{\SI}[2]{%
   \SI@ifempt{#1}{}{\SInum{#1}\SI@unitsep}%
   \SIunit{#2}}
```

3.5 Additional Units

Additional non Latin user symbols are defined:

```
\AtBeginDocument{%
    \@ifpackageloaded{textcomp}{%
         \providecommand*{\micro}{\ensureupmath{\mbox{\textmu}}}%
         \providecommand*{\ohm}{\ensureupmath{\mbox{\textohm}}}%
         \providecommand*{\degC}{\ensureupmath{\mbox{\textcelsius}}}%
         \providecommand*{\degF}{\ensureupmath{\mbox{\textdegree F}}}%
         \providecommand*{\arcdeg}{\ensureupmath{\mbox{\textdegree}}}%
         \providecommand*{\angstrom}{\ensureupmath{\mbox{\capitalring{A}}}}%
    }{%
         \providecommand*{\micro}{\ensureupmath{\mu}}%
         \providecommand*{\ohm}{\ensureupmath{\Omega}}%
         \providecommand*{\degC}{%
             \ensureupmath{{}^{\circ}\kern-\scriptspace C}}%
         \providecommand*{\degF}{%
             \ensureupmath{{}^{\circ}\kern-\scriptspace F}}%
         \providecommand*{\arcdeg}{\ensureupmath{{}^{\circ}}}%
         \providecommand*{\angstrom}{\ensureupmath{\mbox{\AA}}}%
    }%
   \providecommand*{\arcmin}{\ensureupmath{{}^{\prime}}}%
   \providecommand*{\arcsec}{\ensureupmath{{}^{\prime\prime}}}%
}
```

3.6 Locales

3.6.1 Macros

Temporary tokens.

```
\newtoks\ttoks@A
\newtoks\ttoks@B
```

`\SIstyle` The main command to activate a spesific style.

```
\newcommand{\SIstyle}[1]{%
   \@ifundefined{SIstyle#1}%
      {\PackageError{SIstyle}{Style `#1' is not defined}%
                             {See SIstyle package documentation}}%
      {\@nameuse{SIstyle#1}}}
```

`\AddToSIstyle` `\SI@s@addto@stl` `\SI@addto@stl` Append the command list in `#2` to the style command `\SIstyle#1`. The starred form clears the list before appending.

```
\newcommand{\AddToSIstyle}{%
   \@ifstar{\SI@s@addto@stl}{\SI@addto@stl}}

\newcommand{\SI@s@addto@stl}[1]{%
   \expandafter\let\csname SIstyle#1\endcsname\relax
   \SI@addto@stl{#1}}

\newcommand{\SI@addto@stl}[2]{%
   \expandafter\SI@addto@list\csname SIstyle#1\endcsname{#2}}

\@onlypreamble\AddToSIstyle
```

`\SIstyleToLang` Links a locale to the babel language changing `\extras`⟨*lang*⟩.

```
\newcommand*{\SIstyleToLang}[2]{%
   \expandafter\SI@addto@list
      \csname extras#1\expandafter\endcsname
      \csname SIstyle#2\endcsname}

\@onlypreamble\SIstyleToLang
```

`\SI@addto@list` The general macro to append to a list (stolen for varioref).

```
\newcommand{\SI@addto@list}[2]{%
   \ttoks@A{#2}%
   \ifx#1\@undefined
      \edef#1{\the\ttoks@A}%
   \else
      \ifx#1\relax
         \edef#1{\the\ttoks@A}%
      \else
         \ttoks@B\expandafter{#1}%
         \edef#1{\the\ttoks@B\the\ttoks@A}%
      \fi
   \fi
   \ttoks@A{}\ttoks@B\ttoks@A}
```

3.6.2 Country spesific setup

USA: NIST Special Publication 811 – *Guide for the Use of the International System of Units (SI)*

```
\AddToSIstyle{USA}{%
  \SIdecimalsign{.}%
  \SIthousandsep{\,}%
```

```
  \SIunitsep{\,}%
  \SIunitdot{\cdot}%
  \SIunitspace{\;}%
  \SIproductsign{\times}%
  \SIobeyboldfalse
  \SIgroupfourtrue}
```

Germany:

```
\AddToSIstyle{German}{%
    \SIdecimalsign{,}%
    \SIthousandsep{\,}%
    \SIproductsign{\cdot}%
    \SIunitsep{\,}%
    \SIunitspace{\,}%
    \SIunitdot{\cdot}%
    \SIobeyboldfalse
    \SIgroupfourtrue}
```

South Africa: SABS M 33a:1992 – *The international metric system (SI). Guide to the use of the SI in South Africa.*

```
\AddToSIstyle{S-Africa}{%
    \SIdecimalsign{,}%
    \SIthousandsep{\,}%
    \SIproductsign{\times}%
    \SIunitsep{\,}%
    \SIunitspace{\,}%
    \SIunitdot{\cdot}%
    \SIobeyboldfalse
    \SIgroupfourtrue}
```

⟨/package⟩

The end of this package.

Change History

Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

T

U

Z