siunitx: Past, present and future

Joseph Wright

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An appeal for help

```
From: "Stefan Pinnow" <stefan...@tu-clausthal.de>
Newsgroups: comp.text.tex
Subject: SIunits bug
Date: Tue, 20 Nov 2007 21:53:03 +0100

Hello NG,
I want to report that \reciprocal, \rpsquare, \rpcubic, etc. output is written
as "-1" instead of a $-1$, when the package option "textstyle" is used.
I tried to contact Mr. Heldoorn, but he didn't answer until now.
Does anyone have an idea what to do?

Here the minimal example:
%---
\documentclass{article}
    \usepackage[textstyle]{SIunits}
%    \usepackage{SIunits}
\begin{document}
    \reciprocal\second, \rpsquare\metre, \rpcubic\metre or
    $\rpcubic\metre$ instead of $\metre^{-1}$
\end{document}
%---

Best regards,
Stefan Pinnow
```

https://groups.google.com/forum/#!searchin/comp.text.tex/SIunits$20bug|sort:

date/comp.text.tex/CxWCaMmNCYc/Gkp2707muyEJ

I have a bad feeling about this

From: Joseph Wright <joseph...@morningstar2.co.uk>
Subject: SIunits: Improvements, integration with SIstyle, etc.
Date: Thu, 22 Nov 2007 14:00:06 -0800 (PST)

Hello all,

As some of you may have noticed, following a recent bug report
concerning the SIunits package, I have taken over as the package
maintainer. I have uploaded a bug fix for the specific issue to CTAN,
and so hopefully it will appear within a day or two.

It has been suggested by the maintainer of the SIstyle package that
integration of the two be would worth considering. Other suggestions
have also been made in the newgroup and by private mail. I am
therefore planning to review the existing situation and see what
improvements are needed/desirable. As well as SIunits and SIstyle, I
am going to look at numprint, units, unitsdef and hepunits for
inspiration/points to consider/etc.

So far, I have some outline ideas, for example:
...

https://groups.google.com/forum/#!searchin/comp.text.tex/SIunits$20bug|sort:

date/comp.text.tex/bFbvv_kcUKs/xJ-uzIE_0JoJ

Early testing

```
\ProvidesPackage{si}%
  [2008/02/18 v0.6
    A comprehensive (SI) units package]
```

First release

```
From: CTAN Announcements <ctan...@dante.de>
Subject: new CTAN package: siunitx
Date: Wed, 16 Apr 2008 20:23:06 +0100

From my upload daemon:

> Name of contribution: siunitx
> Author's name: Joseph Wright
> Location on CTAN: /macros/latex/exptl/siunitx
> Summary description: A comprehensive (SI) units package
> License type: lppl
```

https://groups.google.com/forum/#!searchin/comp.text.tex/SIunits$20bug|sort:

date/comp.text.tex/PXw8HO8G0HI/92fd8zehsgkJ

Core features

- Parsing and formatting units

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- A single key–value interface
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- Tabular alignment of numbers

From version 1 to version 2

```
\ProvidesPackage{siunitx}
  [2010/02/22 v1.4c
    A comprehensive (SI) units package]
```

From version 1 to version 2

```
\ProvidesPackage{siunitx}
  [2010/02/22 v1.4c
    A comprehensive (SI) units package]
```

- Internals *other than unit parsing* taken from existing packages
- Sub-optimal key–value choices
- Essentially no internal API
- Poor self-coded loops
- ...

Enter expl3

It's all Will's fault!

Enter expl3

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- Amount of library code needed was *significant*
- For key–value support, wrote keys3, now l3keys
- New internal API approaches
- Improved performance

From version 2 to version 3

```
\ProvidesExplPackage {siunitx} {2018/05/17} {2.7s}
  {A comprehensive (SI) units package}
```

From version 2 to version 3

```
\ProvidesExplPackage {siunitx} {2018/05/17} {2.7s}
  {A comprehensive (SI) units package}
```

- Assumptions about fonts: OpenType, *etc.*
- Development of expl3 ideas: code-level API
- Internals still too messy
- Testing purely the PDF documentation
- Monolithic source
- Still too slow

Fonts

Up to version 2

1. Detect current font type
2. `\text` (an `\mbox`)
3. `\ensuremath` or similar
4. Perhaps `\text` (again!)
5. Font command,
   e.g. `\mathrm` or `\rmfamily`

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The new approach

1. Set any aspects *that are needed*
2. Only use an `\mbox` if math version has to be altered

An example

Input:

```
\siunitx_unit_format:nN
  { \joule \per \mole }
  \l_tmpa_tl
\tl_show:N \l_tmpa_tl
```

Output:

```
> \l_tmpa_tl=\mathrm {J}\,\mathrm {mol}^{-1}
```

siunitx v3-alpha

Working

- Core functionality:
  - Unit parsing and formatting
  - Real number formatting
  - Tabular columns
- Existing API: `\num`, `\SI`, `\si`, `S`-column
- New (experimental) document API: `\unit`, `\qty`

To do

- Multi-part numbers
- Ranges and lists
- Mapping between v2 and v3 font control
- Various compatibility settings

Thanks

- Stefan Pinnow
- Danie Els
- Marcel Heldoorn
- Harald Harders
- Eckhart Guthöhrlein
- David Carlisle
- Will Robertson
- Till Tantau
- Enrico Gregorio