`modernruler` Package Documentation

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目次

1   Outline

This package provides modern hrule (`\mruleth`), vrule (`\mruletv`), and `\undernote` internally

└─ Used like this!
   It is the main function
   provided by this pack-
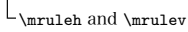   age.

uses the two commands.

```
Intput
1   % normal rule
2   \mruleth[height=1pt, width=5cm, color=blue]
3
4   % dashed rule
5   \mruleth[height=2pt, width=8cm, color=red, dash=true, dash-len=5pt, gap-len=3
    pt]
6
7   % inline rule
8   This is \mruletv[height=\zw, depth=1.5\zw, width=1pt, color=green] a modern
    vrule.
9
10  % inline dashed rule
11  This is \mruletv[height=2\zw, width=1.5pt, color=orange, dash=true, dash-len
    =2pt, gap-len=1pt] a dashed modern vrule.
12
13  % undernote
14  This is under note. This uses \undernote{these commands}{\texttt{\
    textbackslash mruleh} and \texttt{\textbackslash mrulev}} internally and
    enables make flexible outputs.
```

```
Output
```

This is ╎a modern vrule.

This is ╏a dashed modern vrule.

This is under note. This uses these commands internally and enables make flexible out-

└─ `\mruleh` and `\mrulev`

puts.

2 Acknowledgements / Credits

This package was inspired by discussions on TeX Forum concerning undernote-like constructions using rules.

An improved approach was later presented by Mr. Yusuke Terada, which clarified several implementation details.

The present package is a complete reimplementation and extension, introducing a generalized rule-based engine, redesigned control flow, and additional features such as modern ruler integration and `tcolorbox`-based abstractions.

Any remaining errors or design decisions are entirely the responsibility of the author.

3 Note

This package only supports LuaLaTeX.

In this package, a unit `\zw` is used in many parts. It is Japanese standard unit, but it's not normal outside of Japan. When you encounter `\zw` in documemntations, please understand it as `1em`. In detail, `\zw` and `1em` is differnt when you use Japanese characters. But only when you use alphabetic characters and numbers, the difference doesn't matter.

4 Installation

```
Intput
1    \usepackage[<options>]{modernruler}
```

Detailed information regarding the options will be provided in a later section, specifically during the explanation of the `\undernote` command.

5 Commands

5.1 `\mruleth, \mruletv`

5.1.1 Basic Usage

In the first place, `\mruleth` and `mruletv` are extended `\hrule` and `\vrule`. You can use them like this:

```
1  \mruleth[<keyvaloptions>]
2  \mruletv[<keyvaloptions>]
```

These commands share the same keys.

| Key	Type	Default	Description
width	dim	0pt	Width of the rule
height	dim	0pt	Height above the baseline
depth	dim	0pt	Depth below the baseline
color	tl	black	Color of the rule
gap-color	tl	white	Color of the gap segments
dash	bool	false	Enables dashed line if true
dash-len	dim	3pt	Length of the dash segment
gap-len	dim	2.5pt	Length of the gap between dashes

The outputs are as follows:

```
1   \fboxsep=0pt\fboxrule=.1pt%
2
3   % horizontal rule
4   \fbox{\mruleth[height=1pt, width=55pt, color=blue]}
5   \fbox{\mruleth[height=1pt, width=55pt, color=blue, dash=true]}
6   \fbox{\mruleth[height=1pt, width=57pt, color=blue, dash=true]}
7   \fbox{\mruleth[height=1pt, width=59pt, color=blue, dash=true]}
8
9   % vertical rule
10  \fbox{\mruletv[width=1pt, height=55pt, color=blue]}
11  \fbox{\mruletv[width=1pt, height=55pt, color=blue, dash=true]}
12  \fbox{\mruletv[width=1pt, height=57pt, color=blue, dash=true]}
13  \fbox{\mruletv[width=1pt, height=59pt, color=blue, dash=true]}\bigskip
14
15  % Horizontal: Alternating Black and Cyan segments
16  \mruleth[width=120pt, height=2pt, dash=true, dash-len=6pt, gap-len=6pt, color
    =black, gap-color=cyan]\bigskip
17
18  % Vertical: Warning Pattern (Yellow and Black)
```

```
19  \mruletv[width=3pt, height=50pt, dash=true, dash-len=8pt, gap-len=4pt, color=
    yellow, gap-color=black]
```

Output
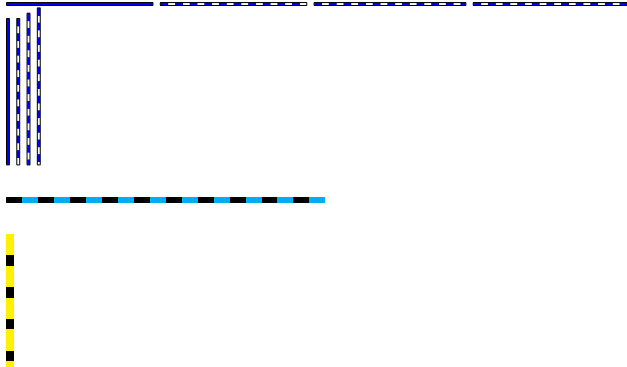
5.1.2 Advanced usage: Use Like Phantom

By setting the width to zero, these commands can be used as "phantoms" that provide arbitrary height and depth. In a traditional way to set a phantom, you use \vphantom or \hphantom. However, the total-height or width depends on the argument. So, I recommend you to use the modern-rulers as a flexible phantom.

Intput

```
1  % To visualize
2  \fboxrule=.1pt\fboxsep=0pt
3
4  % modern-vphantom
5  abc\fbox{\mruleth[height=2em, depth=.5em, width=0pt]def}ghi
6
7  % modern-hphantom
8  jkl\fbox{\mruletv[height=0pt, width=2em]mno\mruletv[height=0pt, width=1em]}
    pqr
```

abcdefghi

jkl mno pqr

5.2 \undernote

5.2.1 Basic Usage

This commands provides underlined annotation. There is some optional parameters which
└─Like this.
adjust the position of the annotation text.

```
1   % grammar
2   \undernote<star option>[<number of lines to shift the note downward>]{<the
    target phrase>}{<annotation>}
3
4   % example
5   In this single paragraph, we deliberately place many annotated terms to
6   stress-test the undernote mechanism, starting with a
7   \undernote{concept}{A brief explanation of the main concept}
8   that appears early in the line, followed closely by another\\
9   \undernote{idea}{A slightly longer explanatory note that is expected to
10  interact with nearby notes} to encourage horizontal overlap detection.
11  As the sentence continues, we insert a fixed-level annotation such as
12  \undernote[2]{method}{This note is forced onto the second vertical level}
13  to verify that manual level assignment overrides automatic stacking,
14  and later a short
15  \undernote{term}{Short note}
16  next to a much longer
17  \undernote*{expression}{This is a considerably longer explanatory note
18  designed to increase the occupied width and push subsequent notes
19  downward in the vertical stacking algorithm}.
20  Near the end of the paragraph, we add one more fixed example,
21  \undernote[3]{result}{A third-level note used to confirm deep stacking},
22  followed immediately by an automatic one,
23  \undernote*{observation}{This final note should be placed at a safe
```

```
24   vertical distance determined by the collision analysis performed
25   during the previous compilation run}.
```

Output

In this single paragraph, we deliberately place many annotated terms to stress-test the undernote mechanism, starting with a concept that appears early in the line, followed
└A brief explanation of the main concept
closely by another
idea to encourage horizontal overlap detection. As the sentence continues, we insert a
└A slightly longer explanatory note that is expected to interact with nearby notes
fixed-level annotation such as method to verify that manual level assignment overrides
└This note is forced onto the second vertical level
automatic stacking, and later a short term next to a much longer expression. Near the

└Short note

└This is a considerably longer explanatory note designed to increase the occupied width and push subsequent notes downward in the vertical stacking algorithm

end of the paragraph, we add one more fixed example, result, followed immediately by an
└A third-level note used to confirm deep stacking
automatic one, observation.
└This final note should be placed at a safe vertical distance determined by the collision analysis performed during the previous compilation run

As the example above shows, the star option puts the annotation text in a parabox. So when you include a long description in the fourth argument of the `\undernote`, the option is the best way to avoid overflow.

Regarding the second argument, "number of lines to shift the note downward" is always determined automatically if you don't specify it. I recommend using this option only when annotations are too close to each other.

Of course, this package provides some package options for adjustments.

Key	Type	Default	Description
notesize	tl	\footnotesize	Font size of the note text
notepos	dim	3mm	Minimum vertical length of the line to the note
noteshift	dim	4mm	Vertical shift amount per level for overlapping notes
noterulethickness	dim	.07\zw	Thickness of the rule used in the note
noterulehshift	dim	1.5mm	Horizontal offset of the vertical line from the underline start
noterulehsize	dim	1.5mm	Length of the horizontal line extending to the note
notesep	dim	0em	Minimum horizontal distance to prevent note overlap
noteoverhang	dim	5em	Extension length of the note parbox (starred version)
noteparstyle	int	0	Border style (0: none, 1: solid, 2: dashed)
notelinecolor	color	black	Color of the the underline and the vertical line

When you want to change some settings in the middle of the document, you can use `\SetUNote`. It takes a keyvalue-style options like this:

```
Intput
1  \SetUNote[noteparstyle=1, notelinecolor=blue]
2
3  LaTeX is a \undernote{versatile}{Abundant package that can be used for free.}
   typesetting system \undernote*{that excels at producing high-quality
   documents}{I think LaTeX is the most flexibly customizable typesetting
   software.}, especially those containing complex mathematical formulas or
   technical structures.
```

```
Output

LaTeX is a versatile typesetting system that excels at producing high-quality documents,
                                                        I think LaTeX is the most flexibly customizable typesetting software.
            Abundant package that can be used for free.
especially those containing complex mathematical formulas or technical structures.
```

These are all the keys provided for it.

Key	Type	Default	Description
notesize	tl	\footnotesize	Font size of the note text.
notepos	dim	—	Minimum vertical length of the line connecting to the note.
noteshift	dim	—	Vertical shift amount per level for overlapping notes.
noterulethickness	dim	—	Thickness of the rules used in the note structure.
noterulehshift	dim	—	Horizontal offset of the vertical line from the start of the underline.
noterulehsize	dim	—	Length of the horizontal line extending towards the note.
notesep	dim	—	Minimum horizontal distance to prevent overlap between notes.
noteoverhang	dim	—	Extra horizontal extension for the note's parbox (used in starred version).
noteparstyle	int	0	Border style for the note (0: none, 1: solid, 2: dashed).
notelinecolor	color	black	Color of the underline and the connected vertical lines.

5.2.2 Additional Description

You can use the command in mathmode.

```
Intput
1  \[
2    \undernote {%
3      a + b
4    }{In the equation envriomnemt.}
5    -
6    \undernote*{%
7      x^5 + 4x^3 + \int_{c}^{\frac{d}{e}}\sum_{k=1}^{n} {}_n\mathrm{C}_k x^k +
       12
8    }{Even the argument includes an expression with large depth, they doesn't
     overlap the other texts.}
9    = \undernote{\frac{a}{b+\frac{x}{6}}}{No problem.}
```

```
10   \]
```

$$a + b - x^5 + 4x^3 + \int_c^{\frac{d}{e}} \sum_{k=1}^{n} {}_n\mathrm{C}_k x^k + 12 = \frac{a}{b + \frac{x}{6}}$$

No problem.

Even the argument includes an expression with large depth, they doesn't overlap the other texts.

In the equation envriomnemt.

6 License

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7 Version History

- **v1.0.0–1.1.0** — Initial public release, and add a fallback for `\zw` and `\ltjgetparameter`.
- **v1.3.1 (2026/01/26)** — Fixed a bug which occurs when `\undernote` command is used in mathmode. The bug was caused my misreplacement of `\@elt`.
- **v2.1.5 (2026/02/06)** — In this update, I made changes in the following two points:
  - Fixed a bug where the arguments of the `\undernote` with large depth caused text overlap.
  - Modernized the internal implementation by migrating from TeX primitives to the expl3 framework.
- **v2.1.6 (2026/02/07)** — Fixed a bug which occurs when `noteparstyle` is set to "2". Also, added an error message to warn users when an invalid `noteparstyle` is provided.