# NMIS8 Graphs Showing letters after the numbers in the $y$ axis 

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## Summary

NMIS8 uses the RRDTool time series database tool for data storage and graphing. When RRDTool has to represent very small or very large numbers, it will normally use SI units instead of showing many decimal places. The following table summarises those units.

| Unit | Name | Decimal Places |
| :--- | :--- | :--- |
| a | atto | -18 |
| f | femto | -15 |
| p | pico | -12 |
| n | nano | -9 |
| u | micro | -6 |
| m | milli | -3 |
|  | (no unit) | 0 |
| k | kilo | 3 |
| M | mega | 6 |
| G | giga | 9 |
| T | tera | 12 |
| P | peta | 15 |
| E | exa | 18 |
|  |  |  |

## Example

So in the chart below the little m in this case is 100 m to 900 m milliseconds is in fact 0.1 to 0.9 milliseconds.


## Customization

If you find this feature undesirable (e.g. because the graph is for percentages), then there are two options for you: you can disable the unit autoscaling, or you can give the graph a fixed y-axis range. Of the two choices, disabling the automatic scaling has less potential for unintended side-effects, but it is still hi ghly advisable that you read the relevant documentation on rrdtool graph options before making that choice.

## Unit autoscaling

You can adjust the relevant graph definitions to not use unit autoscaling. Find the graph file you want to adjust in /usr/local/nmis8/models, and open it with an editor. Locate the options section, and add the "--units-exponent" setting to both standard and small graph definitions, like in the example below:

```
# ... header lines
%hash = (
# ...
    'option' => {
        'standard' => [
            '--units-exponent','0',
            'DEF:ifInUcastPkts=$database:ifInUcastPkts:AVERAGE',
# ... lots of graph definition statement lines
            ],
        'small' => [
            '--units-exponent','0',
            'DEF:ifInUcastPkts=$database:ifInUcastPkts:AVERAGE',
# ...
```


## Fixed Y-Axis Range

As above you need to find the relevant graph file, open it with an editor, and change the relevant option section to include lower-limit and upperlimit, and possibly rigid as well.

The example below is for a fixed-range $0 . .100$ percent graph:

```
'option' => {
    'standard' => [
        '--upper-limit','100',
        '--lower-limit','0',
    '--rigid',
```

