

How to setup TMM xxx-3 controllers for use with A123 cells

If you wish to use A123 cells (LiFePo, etc.) with 3.6V/cell, it is possible to set the switching off voltage using the following procedure:

- 1) calculate the max voltage of charged A123 cells: $U_{in} = \text{number of cells} \times 3.6$
- 2) divide this number by 1.45 PNICD = $U_{in} / 1.45$
- 3) Round up to get an integer – that is the number of cells, which the controller recognizes from the overall voltage for Nixx cells
- 4) multiply by controller switching off voltage for Nixx cells (this can be setup in the range from 0.80 to 1.16V/cells)
- 5) the desired switching off voltage for A123 is set by a suitable choice of the switching off voltage
- 6) set the number of Nixx cells on the controller and the calculated switched off voltage for Nixx

Example 1:

You have **4 cells A123**

- 1) $U_{in} = 4 \times 3.6 = 14.4V$
- 2) $PNICD = 14.4 / 1.45 = 9.93$
- 3) Round up to get **10**
- 4a) minimal possible switching off voltage: **0,80** x **10** = 8V That is 2.0V / A123 cell
- 4a) maximal possible switching off voltage: **1,16** x **10** = 11,6V That is 2,9V / A123 cell
- and of course any voltage between these two limit values (that is from 2.0V to 2.9V / A123 cell).
- 5) if you wish to switch off at **2.5 V/ A123** cell, set the switching off voltage on **1.00V** that is x **10** = 10V altogether, for 4 cells A123 it is $10/4 = 2.5V/cell$.

Program the controller to Nixx cells and the switching off voltage according to your desire (e.g. in the example here 1.00V).

Example 2:

You have **10 cells A123**

- 4) $U_{in} = 10 \times 3.6 = 36V$
- 5) $PNICD = 36 / 1.45 = 24,82$
- 6) Round up to get **25**
- 4a) minimal possible switching off voltage: **0,80** x **25** = 20V That is 2.0V / A123 cell
- 4a) maximal possible switching off voltage: **1,16** x **25** = 29V That is 2,9V / A123 cell
- and of course any voltage between these limit values.
- 5) if you wish to switch off at **2.3 V/ A123** cell, set the switching off voltage on 0,92V that is **0,92** x **25** = 23V altogether, for 10 cells A123 it is $23 / 10 = 2,3V/cell$.

Program the controller to Nixx cells and the switching off voltage according to your desire (e.g. in the example here 0,92V).

Example 3:

You have **12 cells A123**

- 7) $U_{in} = 12 \times 3.6 = 43,2V$
- 8) $PNICD = 43,2 / 1.45 = 29,79$
- 9) Round up to get **30**
- 4a) minimal possible switching off voltage: **0,80** x **30** = 24V That is 2.0V / A123 cell
- 4a) maximal possible switching off voltage: **1,16** x **30** = 34,8V That is 2,9V / A123 cell
- and of course any voltage between these limit values.
- 5) if you wish to switch off at **2.7 V/ A123** cell, set the switching off voltage on 1,08V that is **1,08** x **30** = 32,4V altogether, for 12 cells A123 it is $32.4 / 12 = 2,7V/cell$.

Program the controller to Nixx cells and the switching off voltage according to your desire (e.g. in the example here 1,08V).