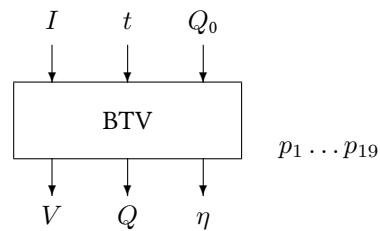


## Block BTV

The BTV block calculates the output voltage of a battery, depending on current and state of charge.



|                   |         |
|-------------------|---------|
| <b>Name</b>       | BTV     |
| <b>Function</b>   | se0019  |
| <b>Inputs</b>     | 2 ... 3 |
| <b>Outputs</b>    | 3       |
| <b>Parameters</b> | 19      |
| <b>Strings</b>    | 0       |
| <b>Group</b>      | S       |

### Inputs

- 1 Current  $I$  / A
- 2 Time  $t$  / s (not evaluated in mode 2)
- 3 Capacity  $Q_0$  / A h (used in mode 2 only)

### Outputs

- 1 Voltage  $V$  / V
- 2 New capacity  $Q$  / A h
- 3 Charging efficiency  $\eta$

### Parameters

- 1 Mode
  - 0 The battery capacity depends on the battery parameters and the inputs of the block; initial value of the battery capacity is given by parameter number 5 (default).
  - 1 The battery capacity is given by input 3.
- 2 Number of cells in series  $N_s$
- 3 Number of cells in parallel  $N_p$
- 4 Nominal capacity  $Q_n$  A h

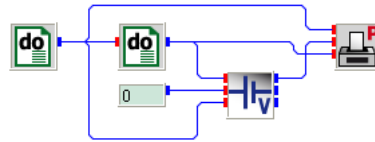
- 5 Initial value of battery capacity  $Q_0$  / A h
- 6 Open circuit voltage charge  $V_{0c}$  / V
- 7 Electrolyte coefficient (charge)  $g_c$  / V
- 8 Inner resistance parameter (charge)  $\rho_c$  /  $\Omega$  A h
- 9 Battery type coefficient (charge)  $M_c$
- 10 Capacity coefficient (charge)  $C_c$
- 11 Open circuit voltage (discharge)  $V_{0d}$  / V
- 12 Electrolyte coefficient (discharge)  $g_d$  / V
- 13 Inner resistance parameter (discharge)  $\rho_d$  /  $\Omega$  A h
- 14 Battery type coefficient (discharge)  $M_d$
- 15 Capacity coefficient (discharge)  $C_d$
- 16 Wood parameter  $a_w$
- 17 Wood parameter  $b_w$
- 18 Wood parameter  $F_\ell$
- 19 Self discharge coefficient  $q_s$  / % of capacity per day

Strings

None

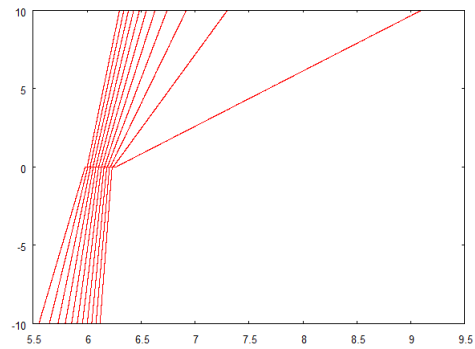
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btv.vseit



Two nested **DO** blocks vary battery capacity (outer block) and current (inner block) from 0 to 100 Ah in steps of 10 Ah and -10 to 10 A in steps of 0.01 A, respectively. The time input of the **BTI** block is set to zero by a **CONST** block and is not evaluated because the capacity mode of the **BTI** block is set to “Battery capacity is given by input 3”.

A parametric plot block **PLOTP** is used to display the voltage-current characteristic of the battery.



See also Block **BTI**, **BCR**.