

Gauge parameter calculator on the web

Overview and best practices

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Gauge Parameter Tools landing page

<http://www.ti.com/tool/gaugeparcal>

Gauging Parameter Calculator

(ACTIVE) GAUGEPARCAL



Description & Features



Technical Documents

Description

GPC variants based on gas gauge types and type of optimization

A. **GPC for Compensated End of Discharge Voltage (CEDV) algorithm gas gauges**

B. ~~GPC for Impedance Track (IT) algorithm gas gauges~~

1. GPC - Find closest chemistry match (chemID selection) Must be done before (2) or (3).
2. GPC - Optimize room temperature performance (calculate Qmax, Ra, and Thermal coefficients).
3. GPC - Optimize room and low temperature performance. Includes (2).

Send
3 temperatures,
2 rates - 6 files
to get **CEDV**
parameters by
e-mail

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TEXAS INSTRUMENTS

GPCCEDV

- <http://www.ti.com/lit/ug/sluub45a/sluub45a.pdf>
- Files needed: config. txt
- Data files:
 - hightemp_highrate.csv
 - hightemp_lowrate.csv
 - roomtemp_highrate.csv
 - roomtemp_lowrate.csv
 - lowtemp_highrate.csv lowtemp_lowrate.csv

Config.txt example

ProcessingType=1

NumCellSeries=1

CellTermV=3200

LearnSOC%=7

FitMaxSOC%=12

FitMinSOC%=6

ChemType=1

ElapsedTimeColumn=0

VoltageColumn=1

TemperatureColumn=2

CurrentColumn=3

Things most commonly going wrong (1)

1. File name not named to a specific name needed for the tool

Need to rename <somename_etc.csv> to <roomtemp_rel_dis_rel.csv >

You can not just rename *.xls file into *.csv! File needs to be **saved from excel using “save as csv”**.

2. File format not coma separated or tab separated

0;4025;-200;25

Will not work.. Should be

0,4025,-200,25

3. Special characters (non-numbers) somewhere in the file

“0,4025,-200,25”

..will not work, remove brackets.

Things most commonly going wrong (2)

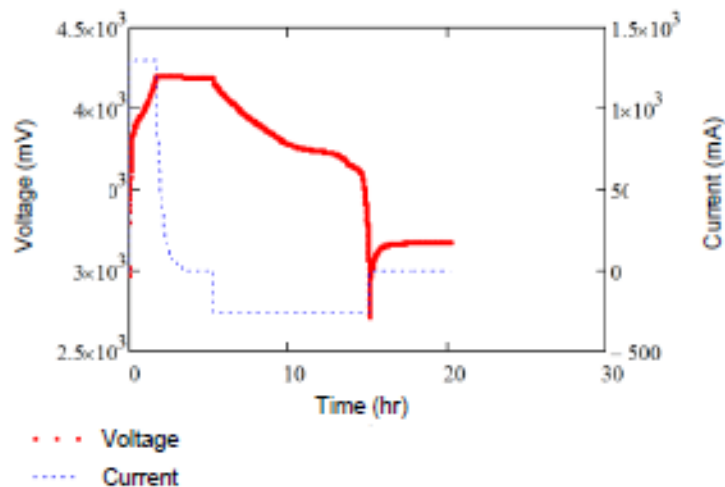


Figure 1. Voltage and Current Profiles of the Test Required for Chemical ID Selection

4. Log file includes zero current portions in the middle of discharge or charge.

Things most commonly going wrong (3)

5. config.txt should have column assignment that is using **zero origin**.

For file with this columns below:

0,4025,-200,25

0,4025,-200,25

Correct assignment (0 origin used):

- ProcessingType=2
- NumCellSeries=1
- ElapsedTimeColumn=0
- VoltageColumn=1
- CurrentColumn=2
- TemperatureColumn=3

Wrong assignment (1 origin used):

- ProcessingType=2
- NumCellSeries=1
- ElapsedTimeColumn=**1**
- VoltageColumn=**2**
- CurrentColumn=**3**
- TemperatureColumn=**4**

Things most commonly going wrong (4)

6. Voltage divider set to actual number of serial cell in the pack, but not for the voltage column that is selected

Time,Cell voltage,Current, Temperature, Pack Voltage
0,4025,-200,25, 8050

Correct assignment:

- ProcessingType=2
- NumCellSeries=1
- ElapsedTimeColumn=0
- VoltageColumn=1
- CurrentColumn=2
- TemperatureColumn=3

Time,Cell voltage,Current, Temperature, Pack Voltage
0,4025,-200,25, 8050

Wrong assignment:

- ProcessingType=2
- NumCellSeries=2
- ElapsedTimeColumn=0
- VoltageColumn=1
- CurrentColumn=2
- TemperatureColumn=3

Things most commonly going wrong (5)

7. Header is not removed from the log file

Wrong, with a header:

Version

Device etc

Time,Cell voltage,Current, Temperature, Pack Voltage

0,4025,-200,25, 8050

Correct, header is cut out:

Time,Cell voltage,Current, Temperature, Pack Voltage

0,4025,-200,25, 8050

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Understanding the report in GPC_CEDV.txt: parameters

CEDV parameters resulting from the fit. If EDVV bit is set to 1, EMF and EDVR0 have to be multiplied by the number of serial cells when written to data flash

EMF	3736
EDVC0	119
EDVC1	0
EDVR1	3360
EDVR0	811
EDVT0	5043
EDVTC	9
VOC75	3945
VOC50	3813
VOC25	3754

Understanding the report in GPC_CEDV.txt: deviations

Error is reported at 7% SOC point

Recommended SOC deviation tolerance at EDV2 point is < 5% for low temperature and <3% for room and high temperature

Deviations for this set of parameters are given below for each file

file	SOC error, %	pass
roomtemp_lowrate.csv	-0.498976847333472	1
roomtemp_highrate.csv	-0.830805388319193	1
hightemp_lowrate.csv	-0.855496431894582	1
hightemp_highrate.csv	3.34543020344157 0	1
lowtemp_lowrate.csv	1.32346644096979	1
lowtemp_highrate.csv	-1.09533242408774	1

In this case error is just slightly above recommended 3%, so it would be acceptable to use the parameters.

To increase accuracy, a rerun with different Max and Min limits can help

Warning: Deviation is above recommended level. Retry the fit with different settings, or proceed on your own risk if the accuracy is acceptable for your application

The bottom portion of the report contains warnings or error messages. Please review them as they are often specific about what need to change, like file format errors

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Accuracy improvement for CEDV

ProcessingType=1

NumCellSeries=1

CellTermV=3200



Make sure correct minimal voltage for your system is used. Using too high voltage will result in too small Capacity reported

LearnSOC%=7

FitMaxSOC%=12

FitMinSOC%=6

ChemType=1

ElapsedTimeColumn=0

VoltageColumn=1

TemperatureColumn=2

CurrentColumn=3

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Accuracy improvement for CEDV

ProcessingType=1

NumCellSeries=1

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LearnSOC%=7

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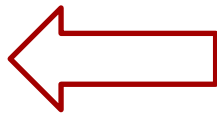
ChemType=1

ElapsedTimeColumn=0

VoltageColumn=1

TemperatureColumn=2

CurrentColumn=3



Reducing the range of the fit can increase accuracy.
7% accuracy is most important since FCC is learned
At this point. You can set Min from 1 to 6, and Max from
8 to 14

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Accuracy improvement for CEDV

ProcessingType=1

NumCellSeries=1

CellTermV=3200

LearnSOC%=7

FitMaxSOC%=12

FitMinSOC%=6

ChemType=1



If you know your cell is not LiCoO2 based, use different Setting. 1=LiCoO2(default), 2=NiMH, 3=Lead-Acid, 4= LiFePO4, 5=Lithium titanate, 6= NCA or NMC

ElapsedTimeColumn=0

VoltageColumn=1

TemperatureColumn=2

CurrentColumn=3

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