

Application Note – LN66 VS BT16C

V02

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Preface

BT16C is the most popular multi-purpose BMS PCM where belong to **3396** platform.
LN66 is BMS PCM belong to **3398** platform, for large charge/discharge current battery system.

BT16C is all-in-one board design.

BT16C has two versions: thin heat sink (40A/40A) & thick heat sink (60A/60A).

LN66 consists of one control board & power board(s), there are two version of power board: 100A and 250A.

BT16C based battery pack is not designed for neither series or parallel cascade.
Battery pack with LN66 could be cascaded in series (need to consult Sales/FAE for detail)
PCM model **L28A** and **L29A** may support parallel cascade.

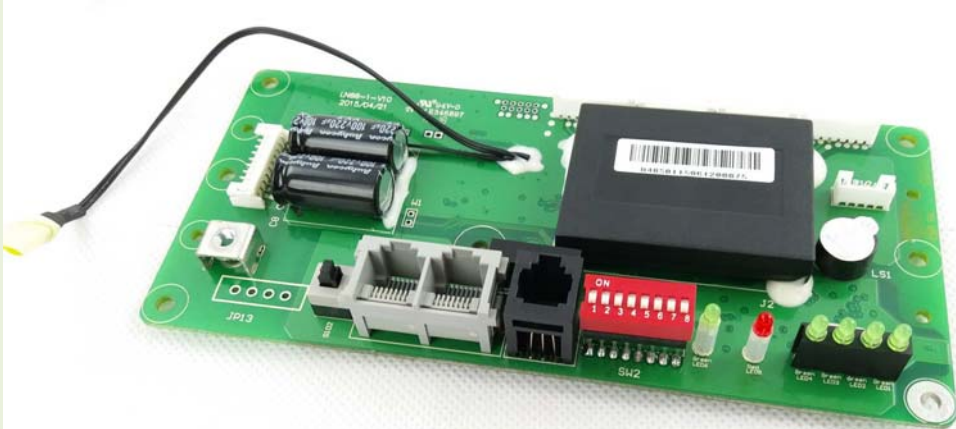
The power boards in LN66 platform can be connected in parallel to increase the total charge/discharge current supported, e.g. 2 pcs 250A power boards could be connected in parallel to support total 500A charge/discharge current capability.

Major difference between the LN66 & BT16C are shown in below:

	BT16C		LN66	
Configuration	Single board		Control board + Power board(s)	
Max Charge	60A (thick heat sink version)		100A/250A ¹	
Max Discharge	60A (thick heat sink version)		100A/250A	
Dimension	Thin heat sink version:	135*95*24mm	Control board:	170*80*18.1mm
	Thick heat sink version:	135*95*33mm	100A Power board:	150*100*33.5mm
			250A Power board:	250.7*120*49.59mm
LED Display	Separate LED board (order separately)		On board LEDs (control board)	
OLED Display	External		External	
Buzzer	No		Yes	
Series Cascade	Can not		Check with Sales/FAE	
Parallel Cascade	Can not		Can not	
Communication	SMBus / TTL232 / PWM		SMBus / RS232 / Dry Contact	
Cell Balancing	Passive: ~80mA		Passive: ~200mA	
Heater Interface	No		Yes	
SOC/SOH Acquisition tool	BMT102N		No special tool is needed	
Software	SBAE / SBAA		BMTUPSDatLog-EN-LN66-1.0.1.exe	
Parameter change	Some parameters could be changed via BMT102N and SBAA software		Check with Sales/FAE for detail	

¹ Untested data

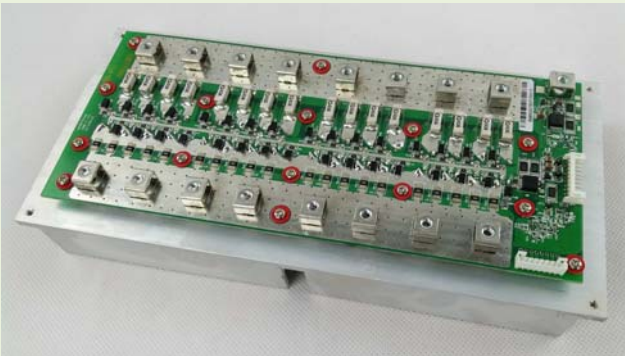
LN66 control board (170*80*18.1mm)



LN66 – 100A power board (150*100*33.5mm)



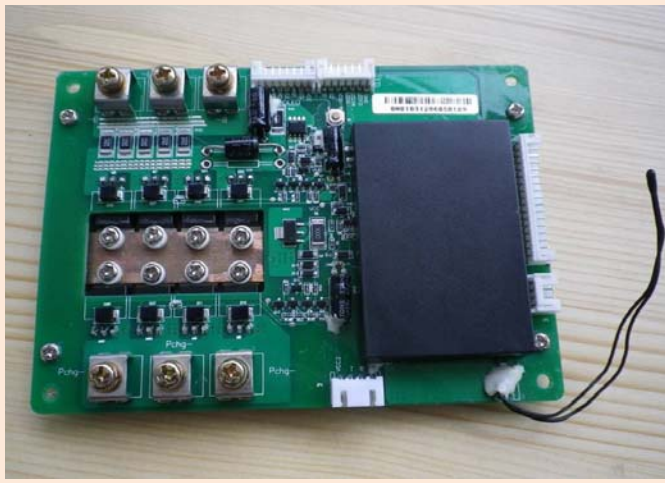
LN66 – 250A power board (250.7*120*49.59mm)



BT16C (thick heat sink version) - 135*95*33mm



BT16C (thin heat sink version) - 135*95*24mm



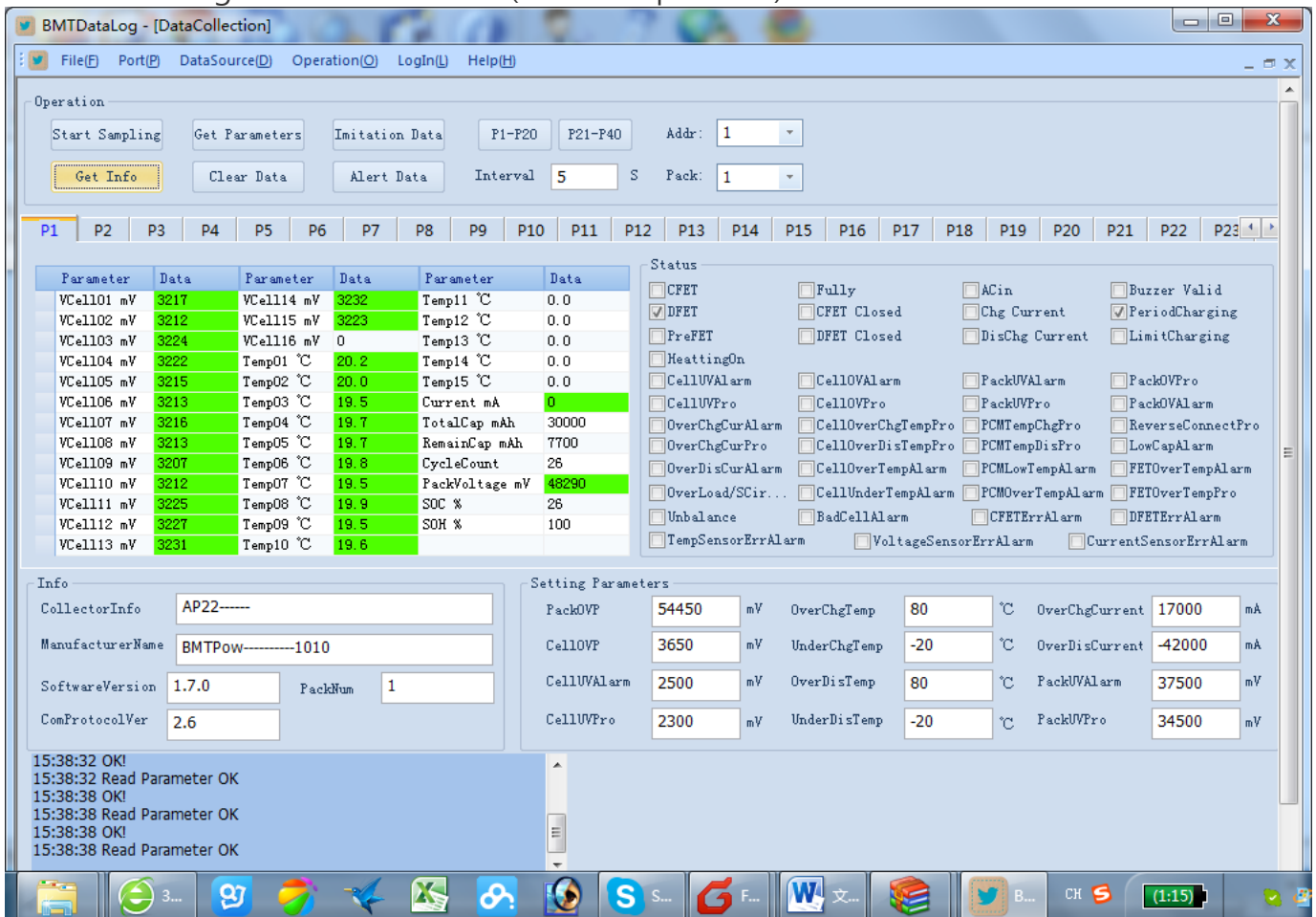
Software Support

SOC/SOH of 3396 based battery could be monitored and logged by connecting special tools (BMT102N) to it's SMBus port and use **SBAE or SBAA** type Windows software.

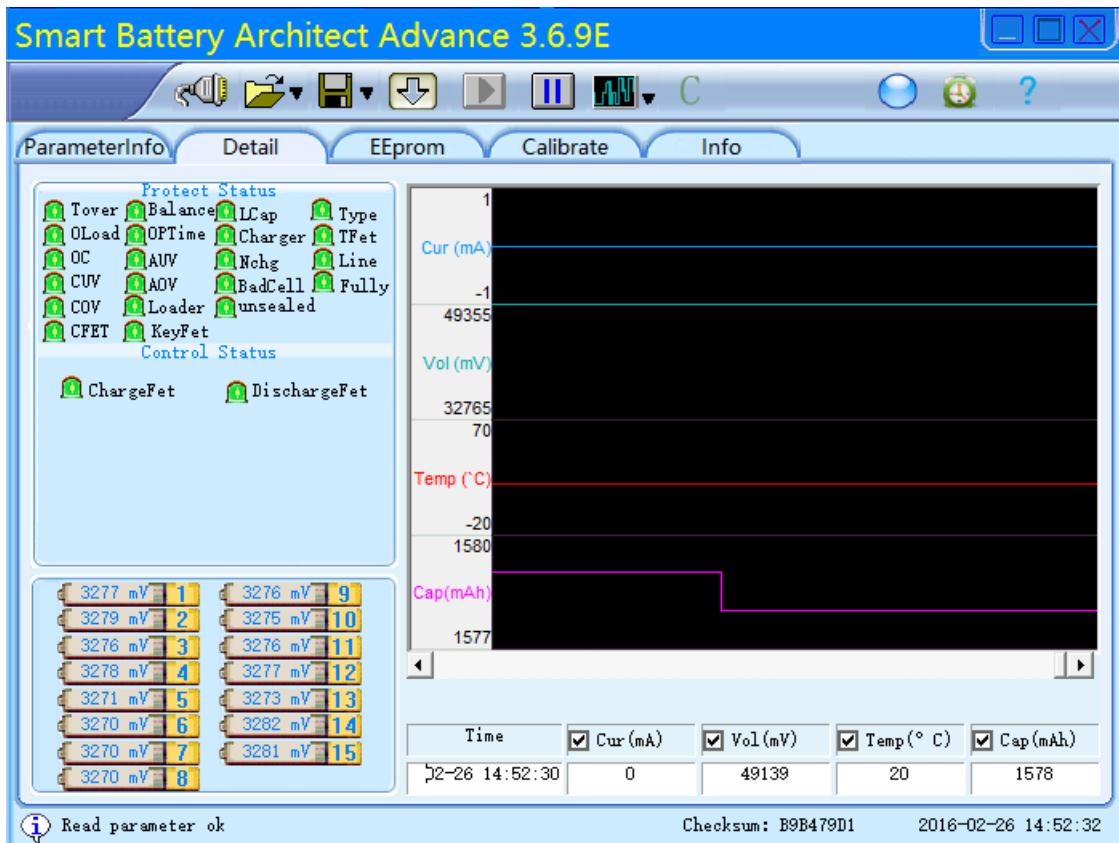
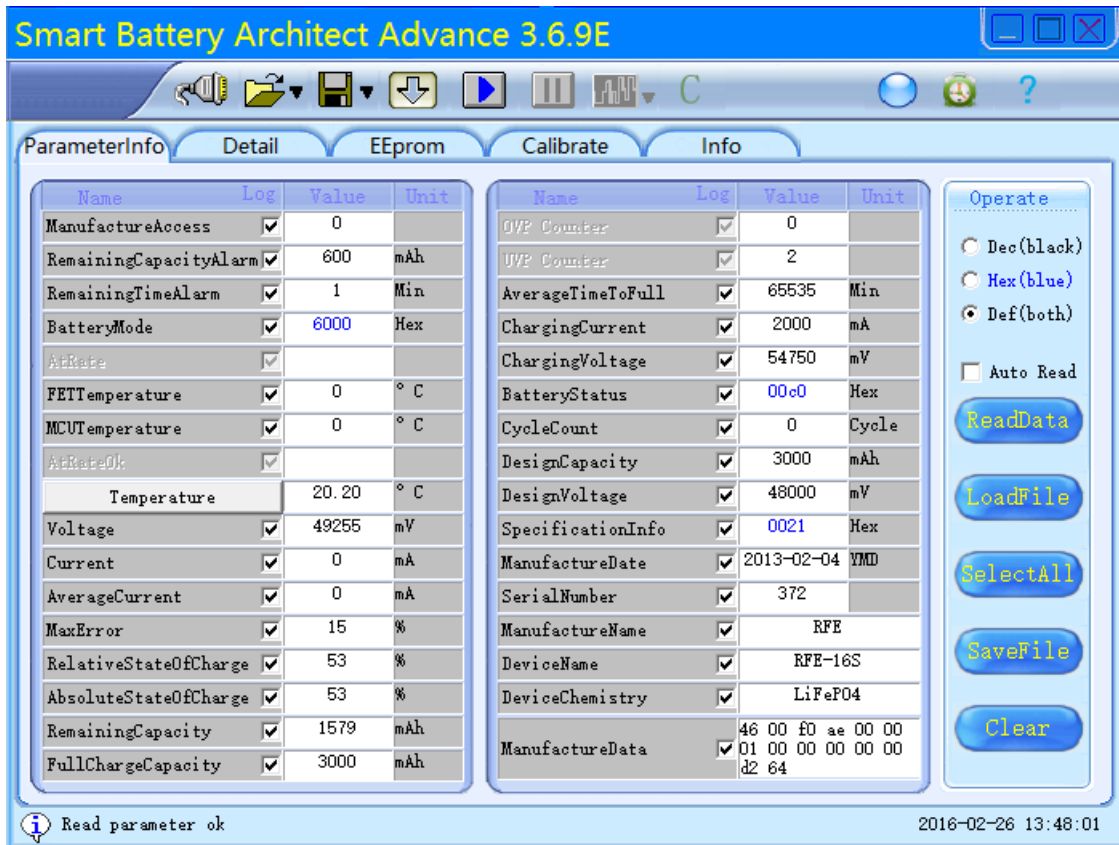
SOC/SOH of LN66 based battery could be monitored and logged by connecting cable directly to the RS232 port of LN66, Windows software like **BMTUPSDaLog-EN-LN66-1.0.1.exe** is used.

	SBAE	SBAA	BMTUPSDaLog-EN-LN66
Platform support	3396	3396	LN66 Only
SOC/SOH Monitoring	Yes	Yes	Yes
Historic logging	Yes	Yes	Yes
Battery Parameter Modification	No	Some	No
V/I/Temp Calibration	No	Yes	No
Communication Port	SMBus	SMBus	RS232
Reading Tool	BMT102N	BMT102N	No need
For user whom need to modify the LN66 parameters, please check with our Sales/FAE			

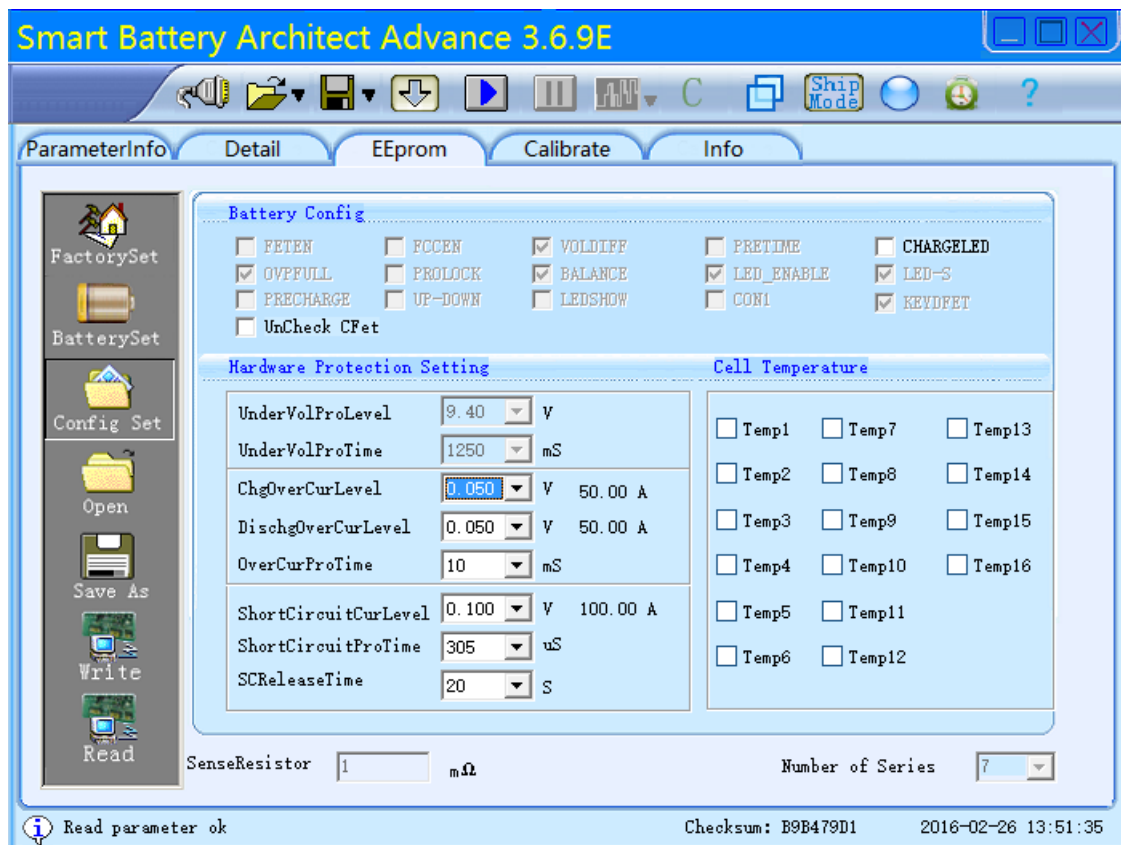
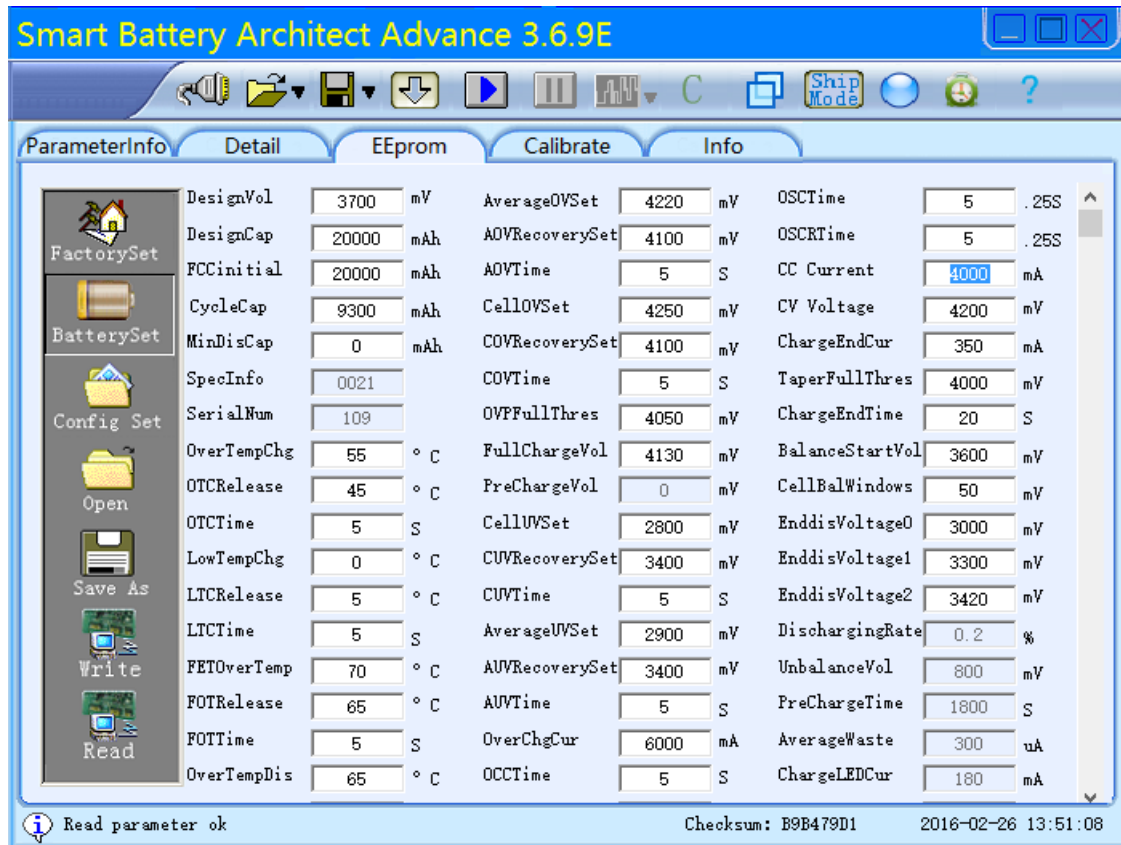
BMTUPSDaLog-EN-LN66-1.0.1.exe (For LN66 platform)



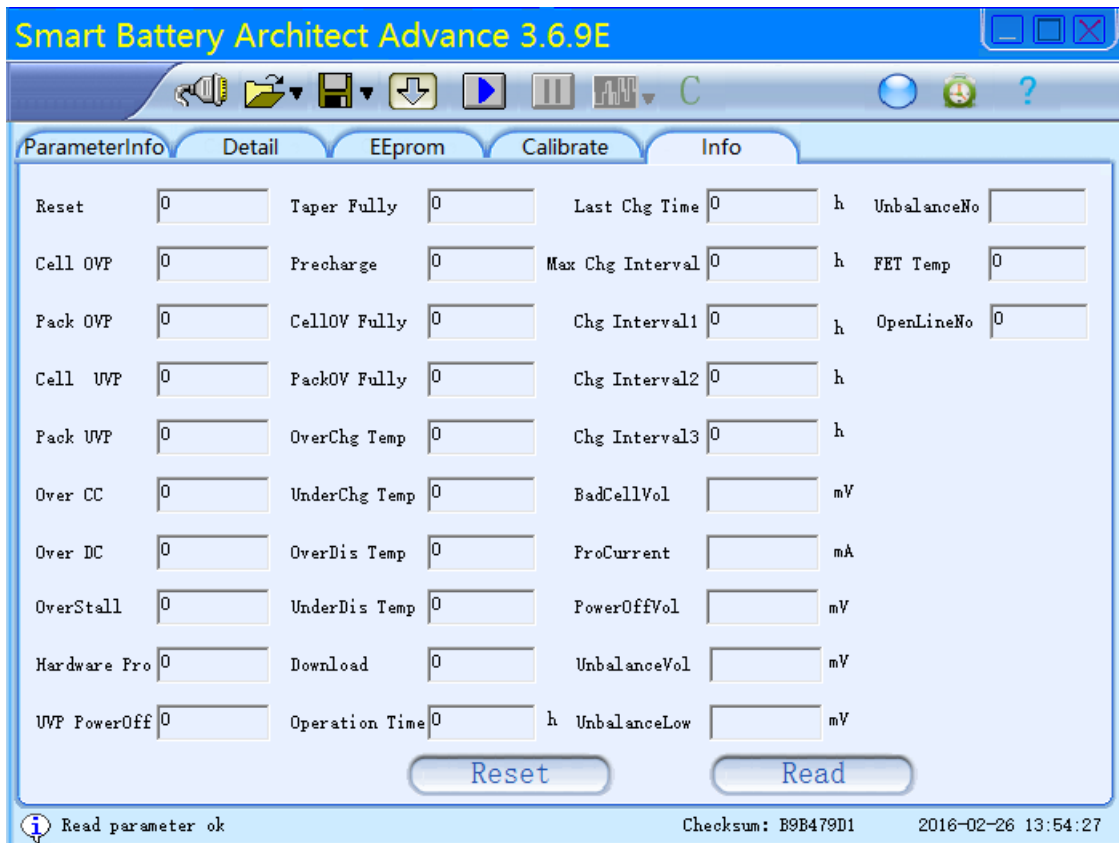
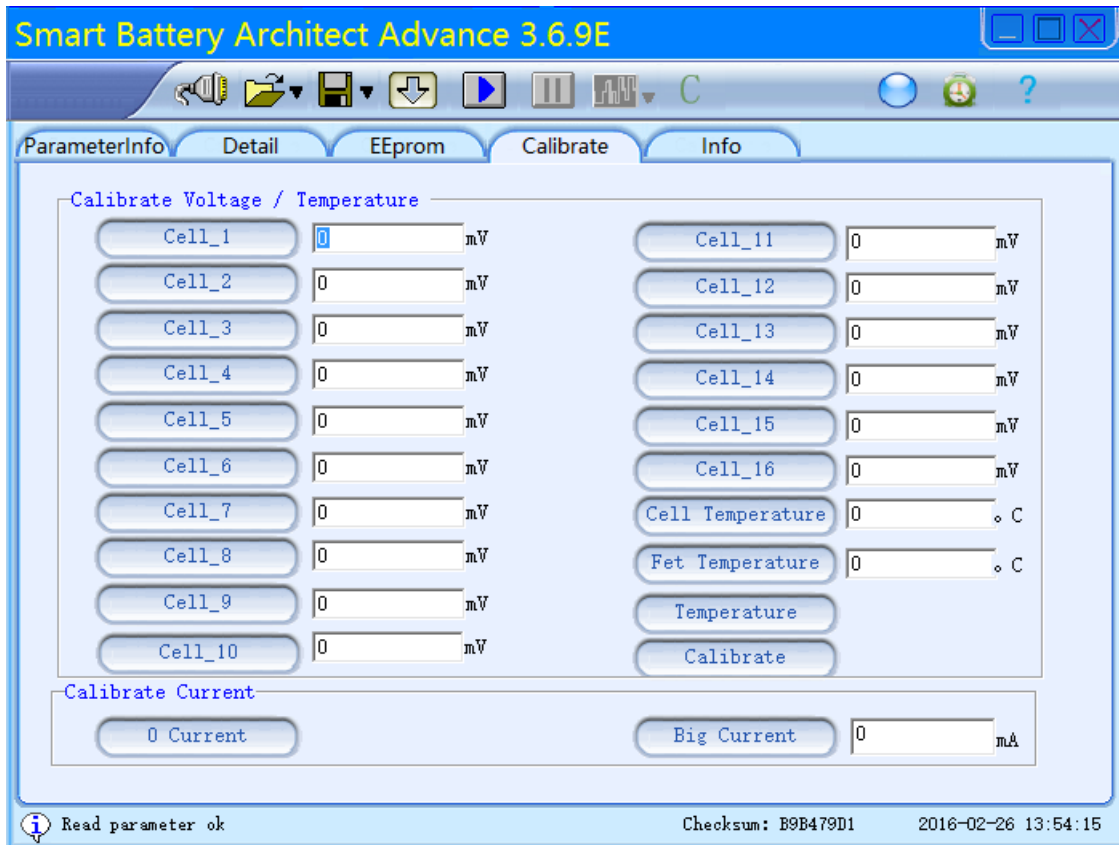
SBAA-3.6.9E.exe (For 3396 platform)



SBAA-3.6.9E.exe (For 3396 platform)



SBAA-3.6.9E.exe (For 3396 platform)



FAQ

Is there price difference between the thick and thin heat sink BT16C ?

ANS: May be, depend on capacity and maximum allowed current settings

Is there price difference between the BT16C-8S and BT16C-15S ?

ANS: May be, price may be different per type of application, number of series, charge/discharge current, battery capacity, type of communication port needed (SMBus, TTL232, PWM), need for RTC, need for host communication, need for dry contact output,

Is the charge/discharge current of the thin heat sink BT16C limited to 40A ?

ANS: 40A for thin heat sink and 60A for thick heat sink are only reflects the test condition that does not use the metal chassis for heat dissipation, however one may attach the heat sink of the thin version BT16C to the metal chassis to enhance the heat dissipation, in that case, the thermal performance of the thin version may even outperform the thick version. (surface of heat sink on thick version is not flat so it can not be attached to chassis)

Also it's hard to say the current limit of the thin/thick is 40A/60A, it's highly depending on how the PCM is mounted inside the battery and how the battery is designed, as a result, the thin version should be able to support from 30A~80A continuous and the thick version should support from 50A~90A continuous, the PCM itself may stand very high temperature, only concern is the heat sink temperature affects the battery cells.

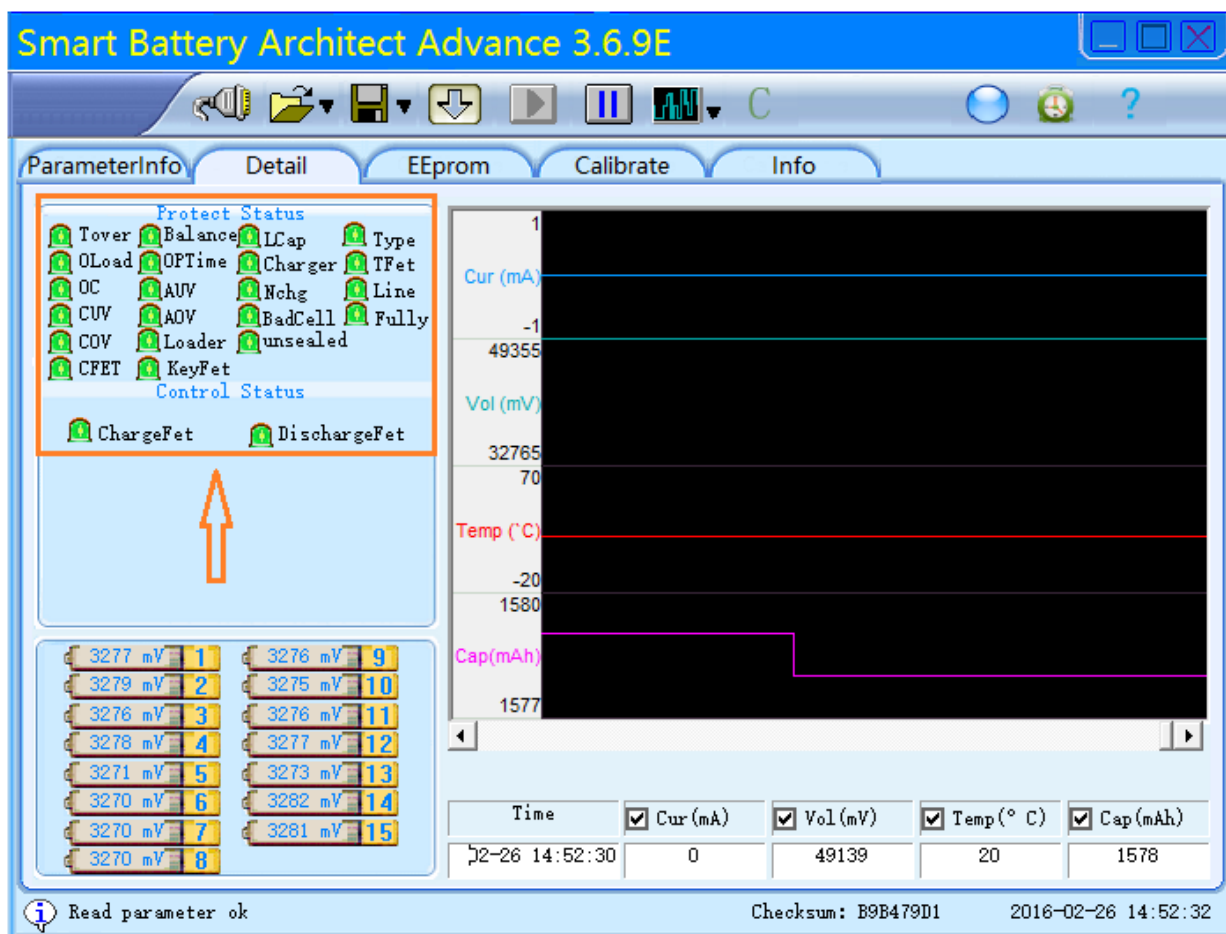
Can LN66 PCM be used in series connection ?

ANS: The LN66 PCM may or may not be able to support series cascade, all upon the ex-factory configuration, therefore before purchase, user should fill up a DCL (Design Check List) form in order to notify us a series cascable version is needed.

How many pieces of LN66 based batteries can be connected in series ?

ANS: Need to consult BMTPow Sales/FAE.

What are the meanings of miscellaneous status shown in SBAE/SBAA software **Detail** page ?

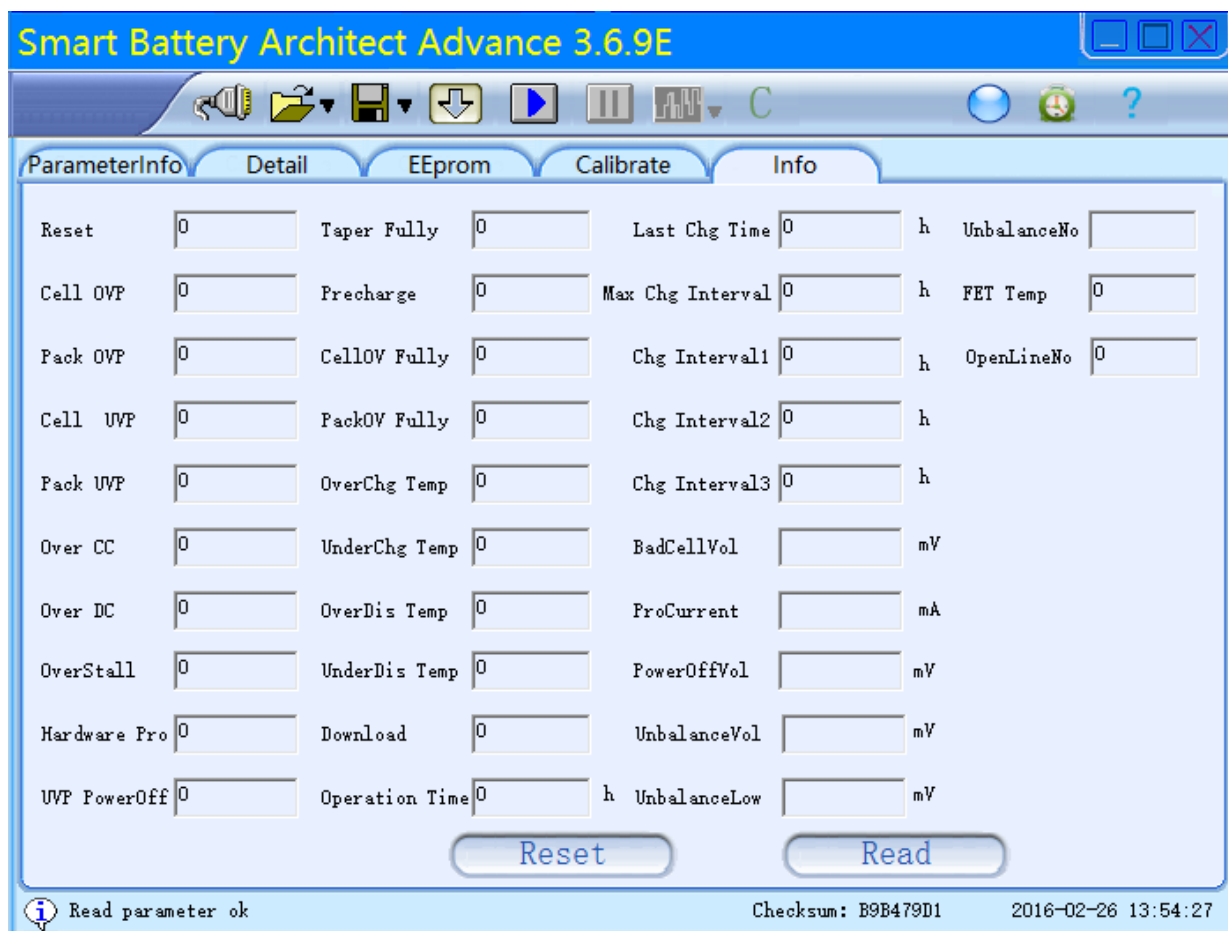


ANS: Different icon color reflects the protection status, so that
 = unprotected = protected, below table explains the meaning of every abbreviation, for further questions, please consult our Sales/FAE

Protection Status			
Tover	Over temperature	AOV	Over voltage (cell average)
OLoad	Over load / short circuit	Loader	Reserved
OC	Over current	LCap	Low capacity
CUV	Cell under voltage	Charger	Reserved
COV	Cell over voltage	Nchg	No charge
CFET	Charge FET error	BadCell	Reserved
Balance	Unbalance	Type	Reserved
OPTime	Precharge time-out	TFet	Over FET temperature
AUV	Under voltage (cell average)	Line	Battery disconnect
Other Status			
KeyFet	Reserved	Fully	Reserved
Unsealed/sealed	Reserved		

Where to find the log information in the SBAE/SBAA software ?

ANS: Information is logged inside the on-board non-volatile memory, it may be examined by reading the **Info** page of the SBAE/SBAA software



For example, if **Cell OVP** = 3, that means the **Cell Over Voltage Protection** has been triggered for 3 times, it's very useful especially during system debugging, by comparing the data right after the installation and right after the battery system had problem.

The definition of each log event are shown in the below table,

Item	Description	Item	Description
Reset	Reserved	Taper Fully	Reserved
Cell OVP	Cell over voltage protection	Precharge	Precharge
Pack OVP	Pack over voltage protection	CellOV Fully	Reserved
Cell UVP	Cell under voltage protection	PackOV Fully	Reserved
Pack UVP	Pack under voltage protection	OverChg Temp	Over temperature protection in charging
Over CC	Over charge current protection	UnderChg Temp	Under temperature protection in charging
Over DC	Over discharge current protection	OverDis Temp	Over temperature protection in discharging
OverStall	Reserved	UnderDis Temp	Under temperature protection in discharging
Hardware Pro	Reserved	Download	Reserved
UVP PowerOff	Power down due to UVP	FET Temp	Over FET temperature protection

Other log Information

Item	Description
Operation Time	Accumulated operating time
Last Chg Time	Elapse time since last charge
Max Chg Interval	Maximum time interval between 2 charges
Chg Interval1	Charge interval 1
Chg Interval2	Charge interval 2
Chg Interval3	Charge interval 3
BadCellVol	Reserved
ProCurrent	Reserved
PoweroffVol	Lowest cell voltage during power down due to pack UVP
UnbalanceVol	Largest voltage difference in Unbalance protection
UnbalanceLow	Lowest cell voltage in Unbalance protection
UnbalanceNo	Highest and lowest cell number in Unbalance protection
OpenLineNo	Cell number during battery disconnect

The BT16C/LN66 data sheet stated that it can support 3~16S, does it mean user may buy one back and free to use it to make battery from 3~16S and with different capacity ?

ANS: Definitely not ! The data sheet provides a general description of the board, in fact the board should be pre-configured by BMTPow according to the DCL content (e.g. Number of series, battery capacity, varies protection threshold and delay, ... etc.)

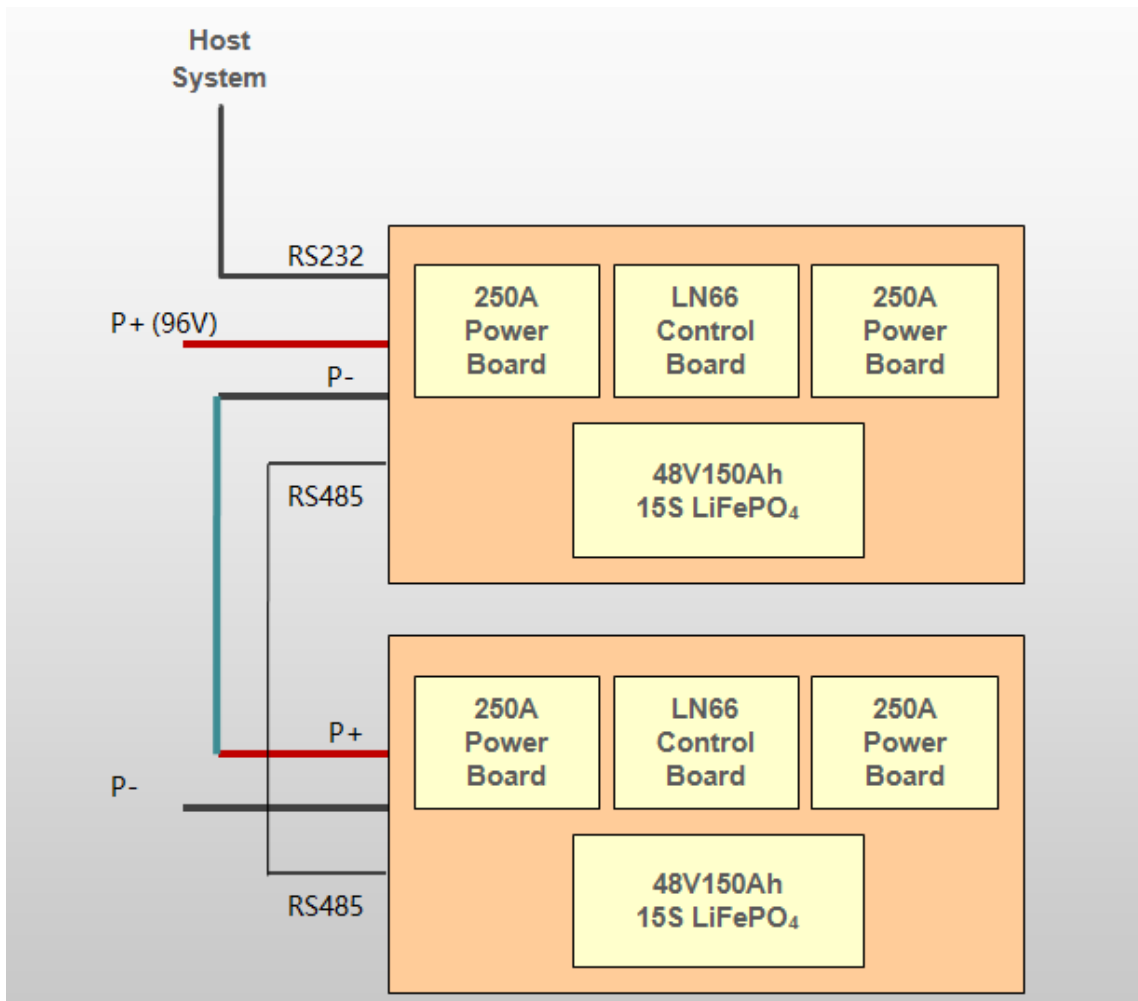
User whom need to modify the board parameters afterward need to check with Sales/FAE for detail.

How can I form a 96V150AH 450A battery system using LN66 PCM ?

ANS:

- First build up two 48V150AH batteries, each one consists of one piece LN66 control board and two pieces of 250A power board
- Connect the two batteries in series.

Therefore total two pieces of control board and four pieces of 250A power board are needed.



Software download

Download your copy of software here

SBAE/SBAA	http://pan.baidu.com/s/1bochNor	password: axgb
BMTUPSDatLog-EN-LN66	http://pan.baidu.com/s/1gdY580j	password: 7wou
WIN7/WIN10 BMT102N	http://pan.baidu.com/s/1hrgAWgG	password: h7pp

Alternative download in Dropbox

SBAE

https://www.dropbox.com/sh/qim8ul8ywb6ss6r/AADxvzeyGGcl-MrHhclYn__Da?dl=0

SBAA

https://www.dropbox.com/sh/dzgg51yu9y1oxv6/AAAHuUZVt8meYwNOqzX4Y_wqa?dl=0

BMTUPSDatLog-EN-LN66

<https://www.dropbox.com/sh/f3c1h6uyntbebr0/AABiCbGk3hRI95YhEIYkKftqa?dl=0>

WIN7/WIN10 BMT102N driver

<https://www.dropbox.com/sh/nhpwp7zz2y739ph/AABzepYmb-l2peWNenaa3k32a?dl=0>