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# 大疆电池密码、维修、解锁、改容量、 教程

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## 一、背景

修改无人机电池有风险,此教程仅提供交流学习使用,请勿模仿,本人不承担任何相关责任。

其中很多数据来源于网络,版权归原作者所有。供学习研究交流之用 版权归原作者所有,请下载后 24 小时内删除,严禁作商业用途。

教程中如有错误, 请多包涵。

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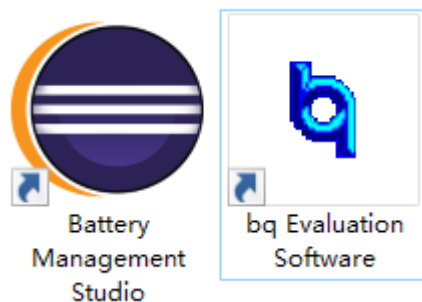
## 二、软件的安装

现在常见的大疆无人机有精灵 2、精灵 3、精灵 4、植保、悟 1、悟 2、御 1、御 2、御 air、御 air2、御 mini、晓、Air 2s 等。电池维修所需的程序有两种。

其中悟 1、悟 2、晓、御 2、御 air、御 air2、Air 2s、御 mini、植保、使用 Battery Management Studio 简称 bqStudio 是较新版的软件

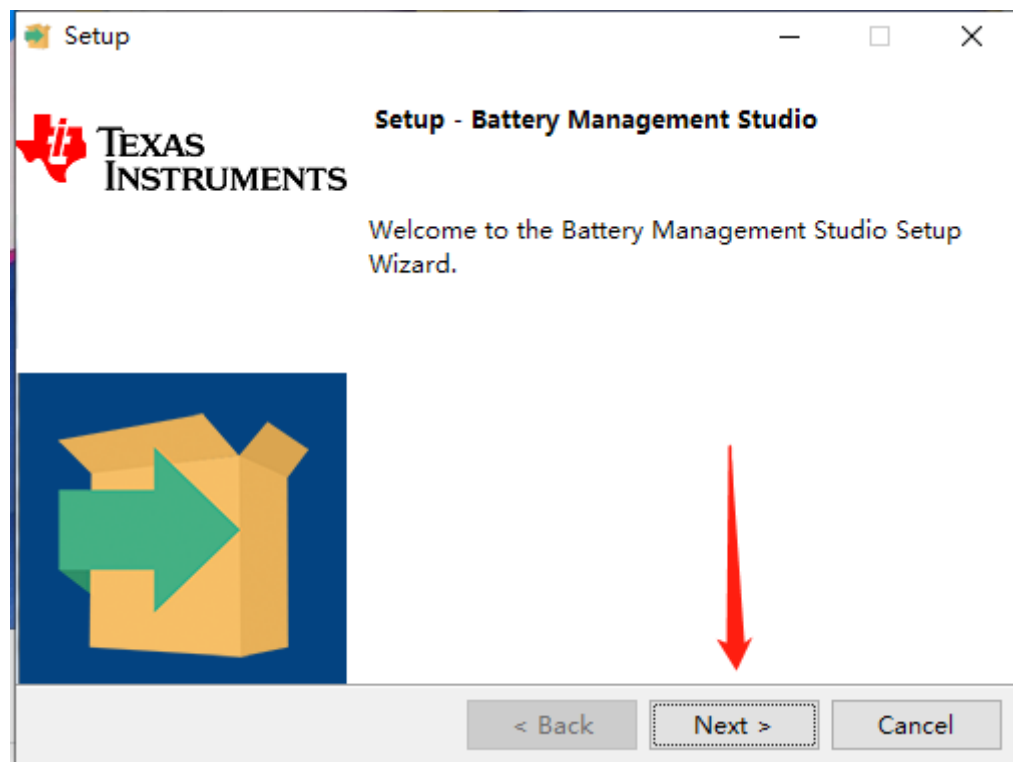
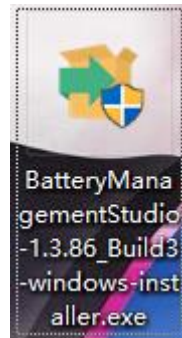
精灵 2、精灵 3、精灵 4、御 1、御 Pro 等使用 bq Evaluation Software 软件相对较老，还需要额外安装驱动程序 Support components to enable specific TI software (bqEVSW) to work with EV2400。

根据自己的机型，**二选一**安装。

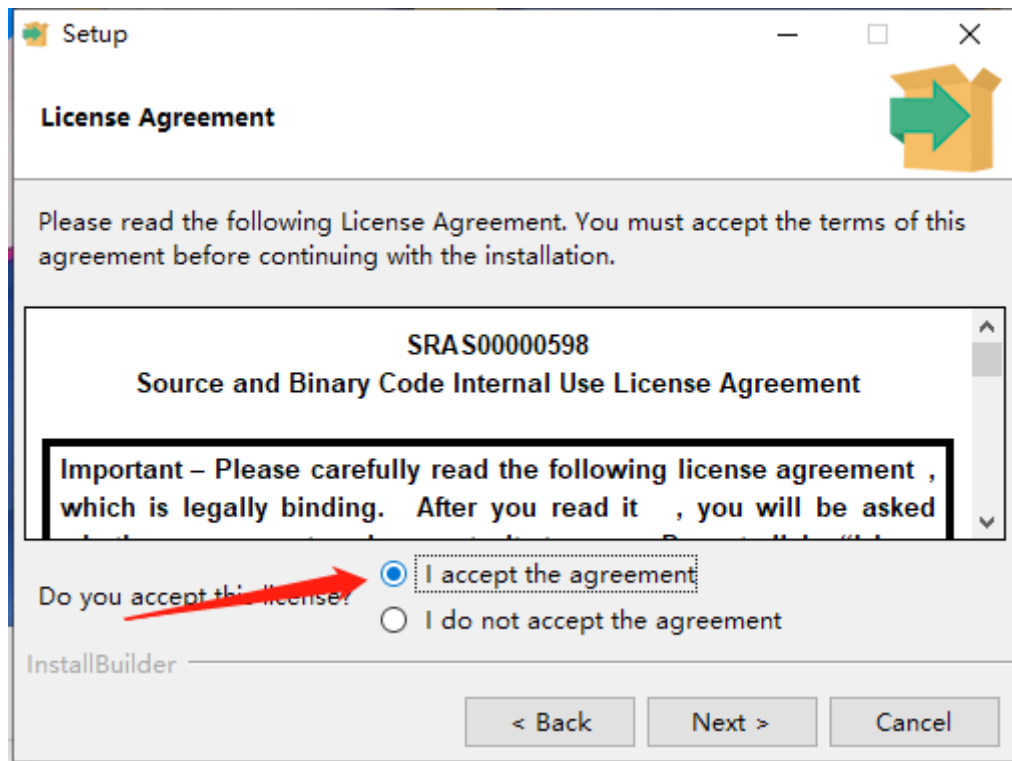


### 1. Battery Management Studio 安装

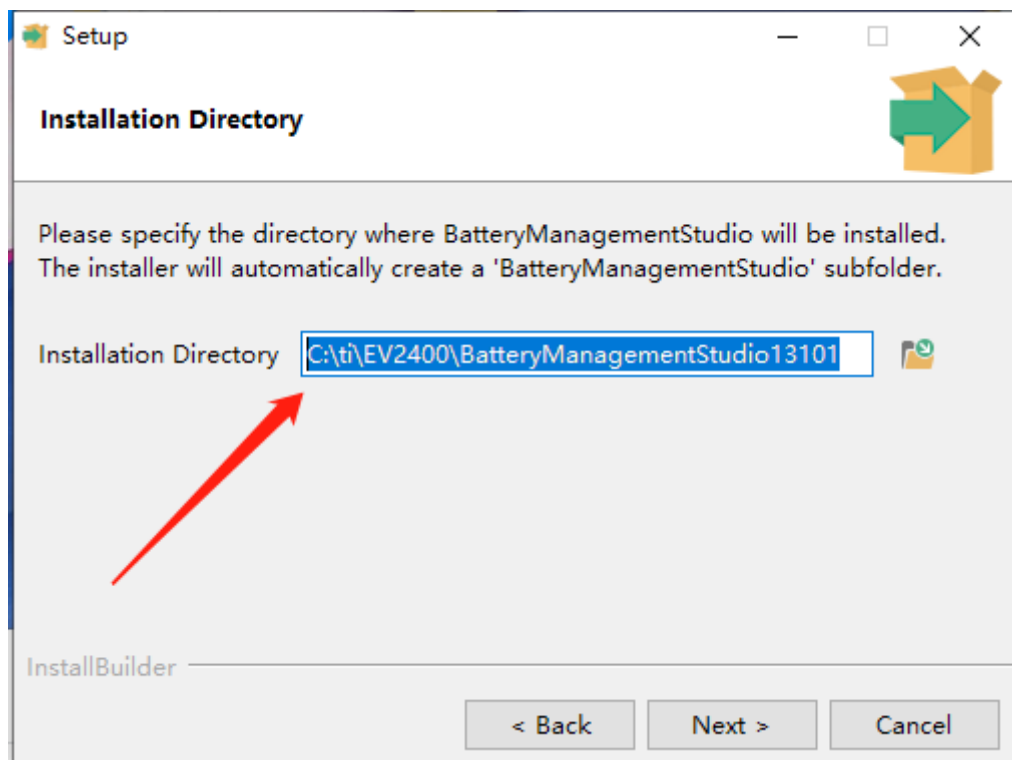
双击安装包



同意协议



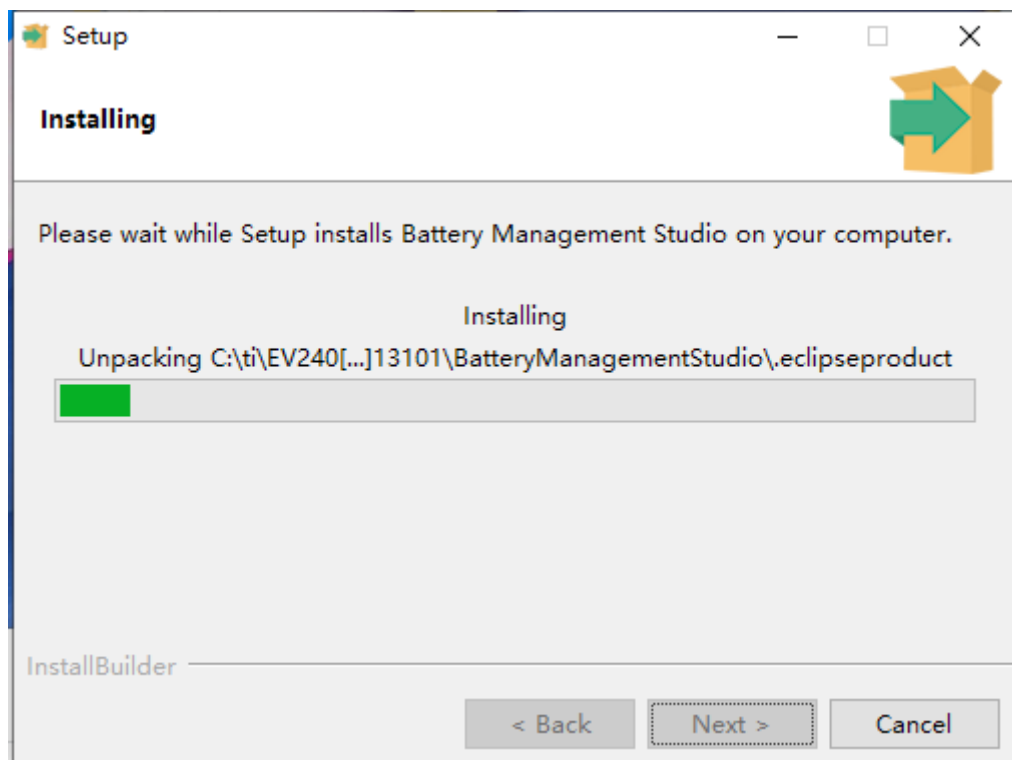
选择安装目录，建议默认，软件不大，其他目录后面会出现各种问题。目录中不要有汉字。



下一步

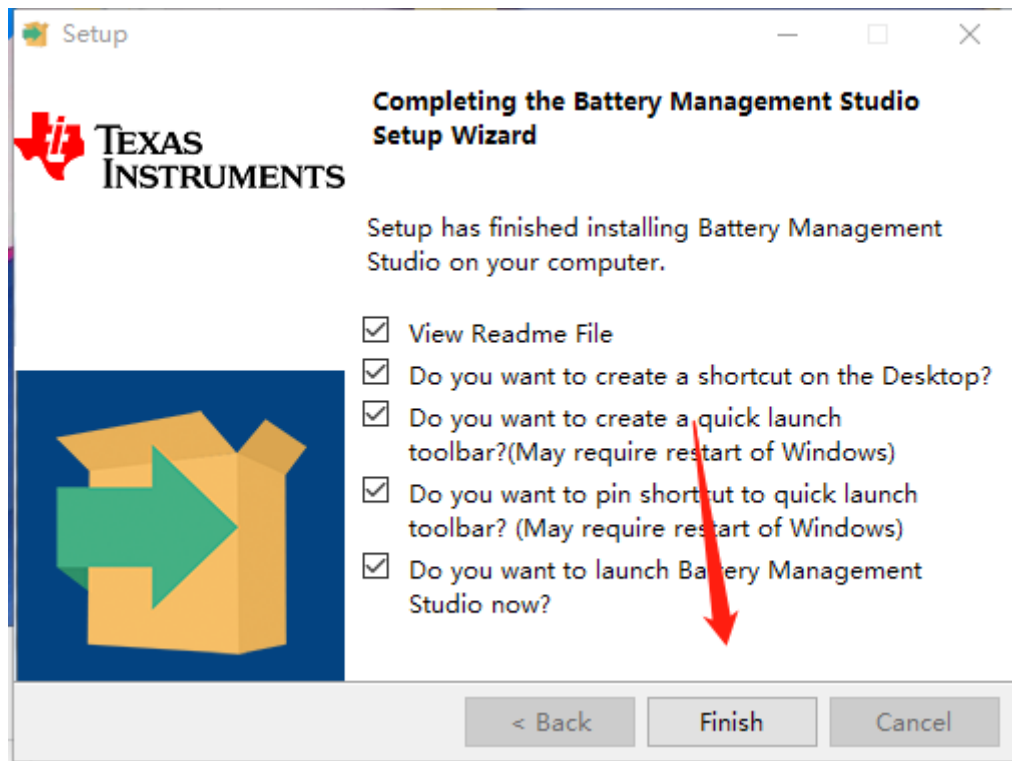


正在安装



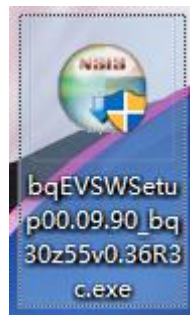
结束安装



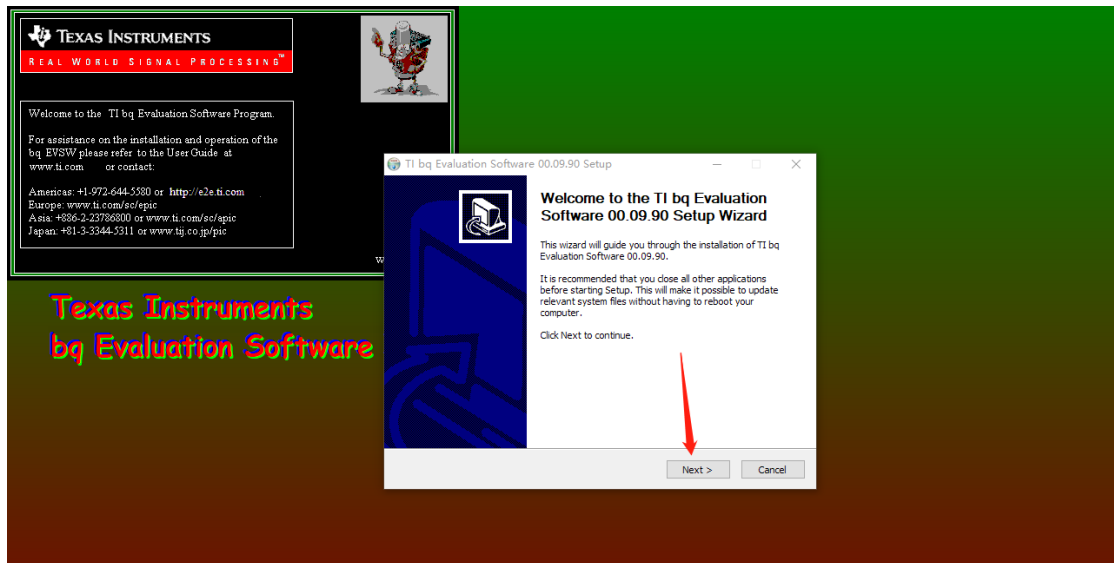


## 2.bq Evaluation Software 安装

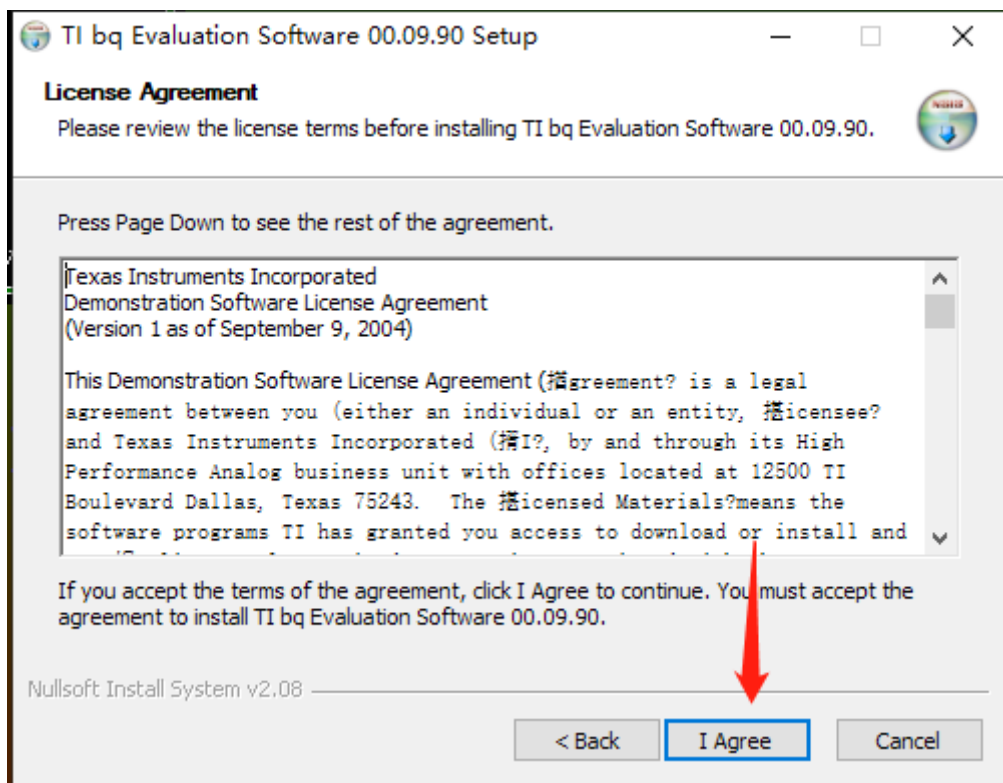
双击安装包



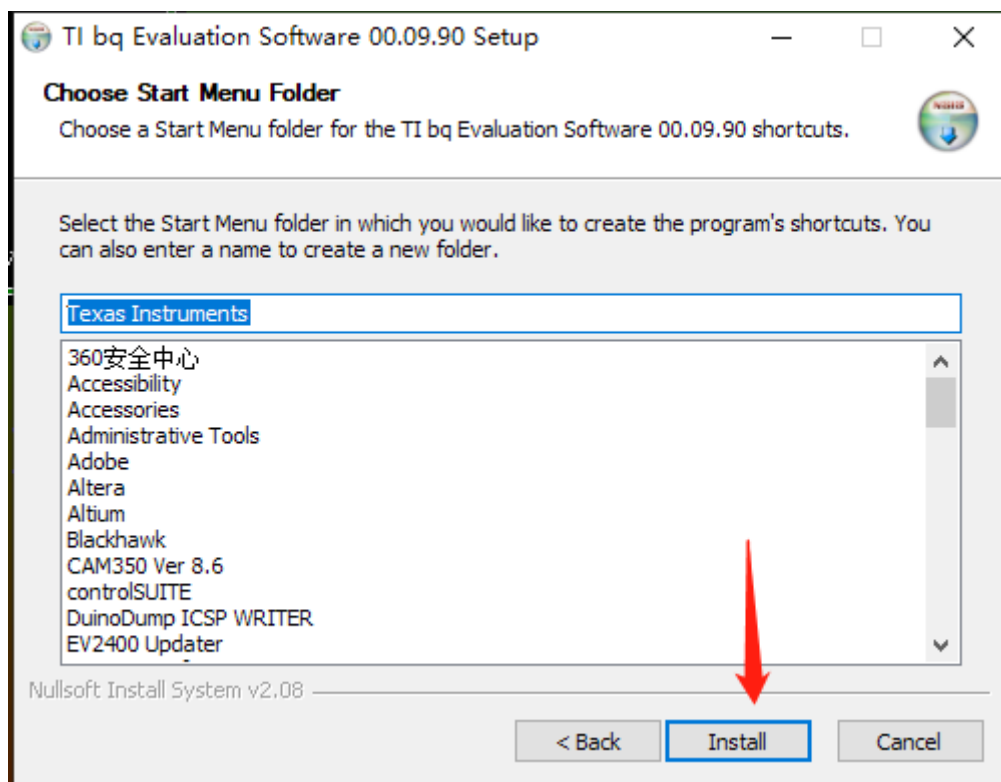
开始安装，看着就很古老。



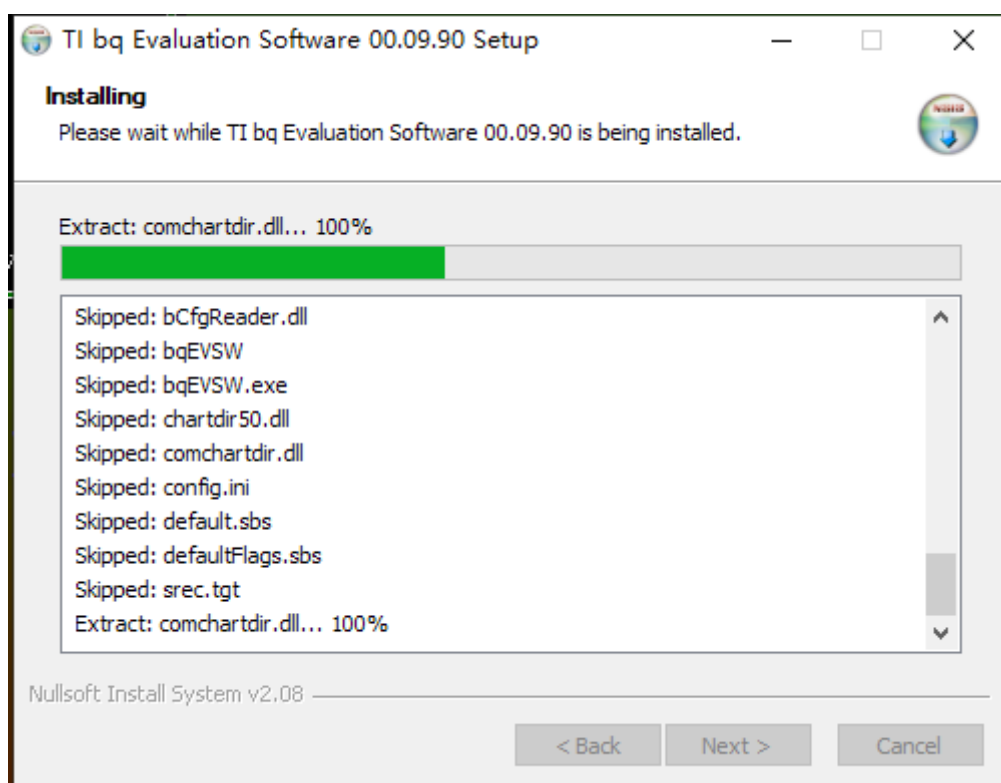
同意协议



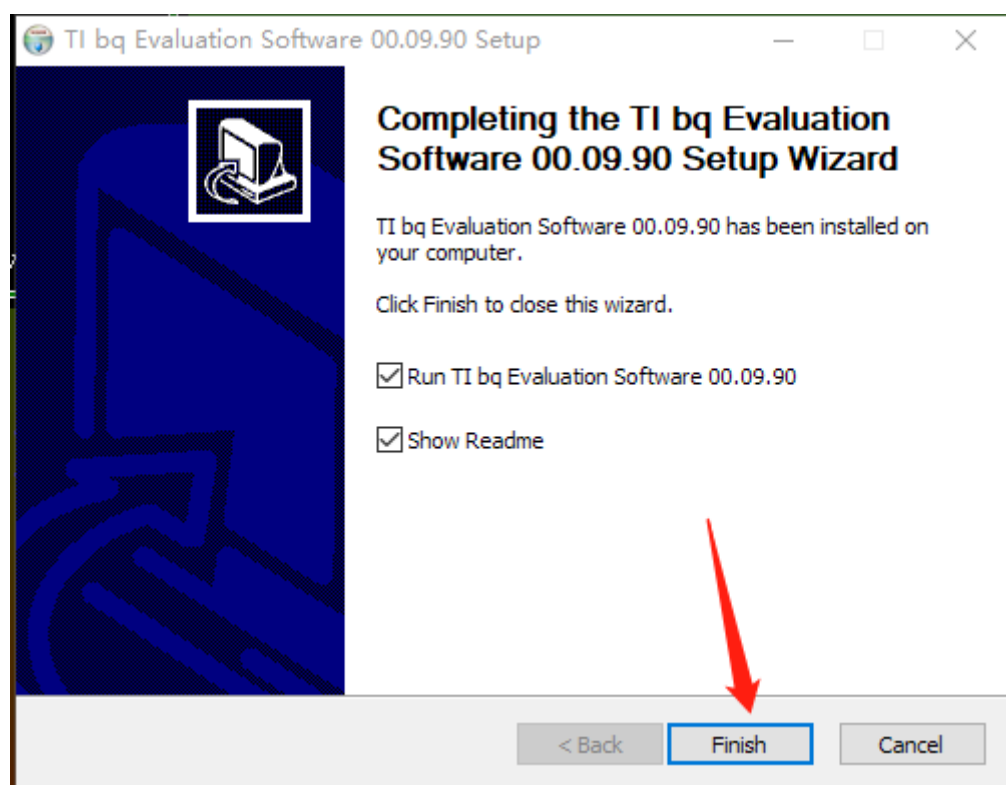
选择开始菜单快捷方式



正在安装



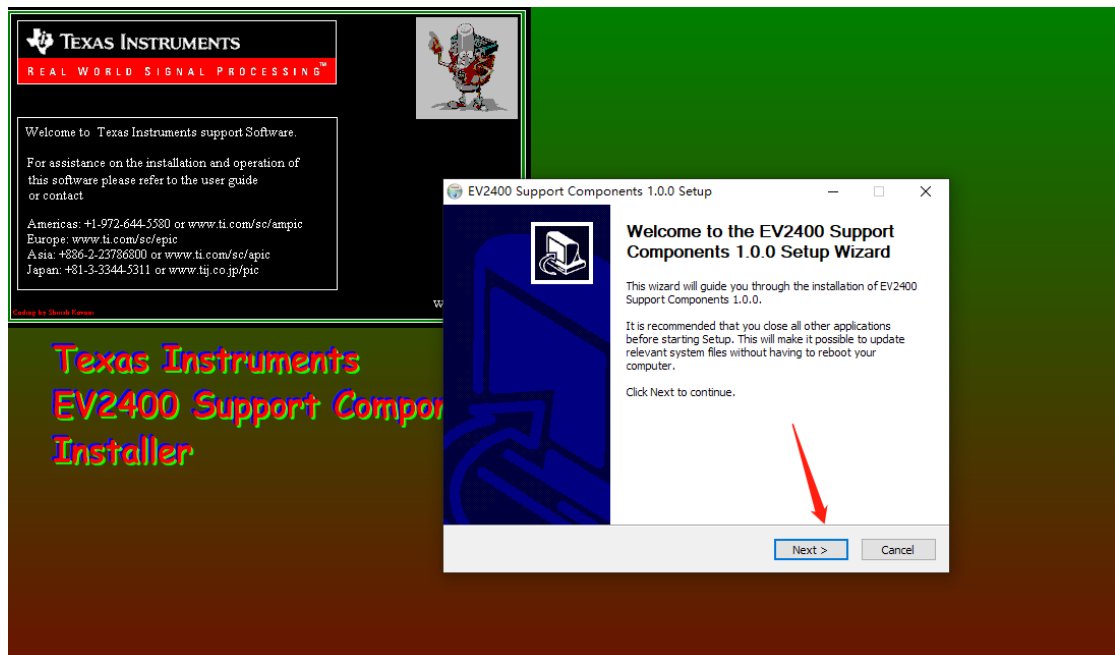
顺利安装完成



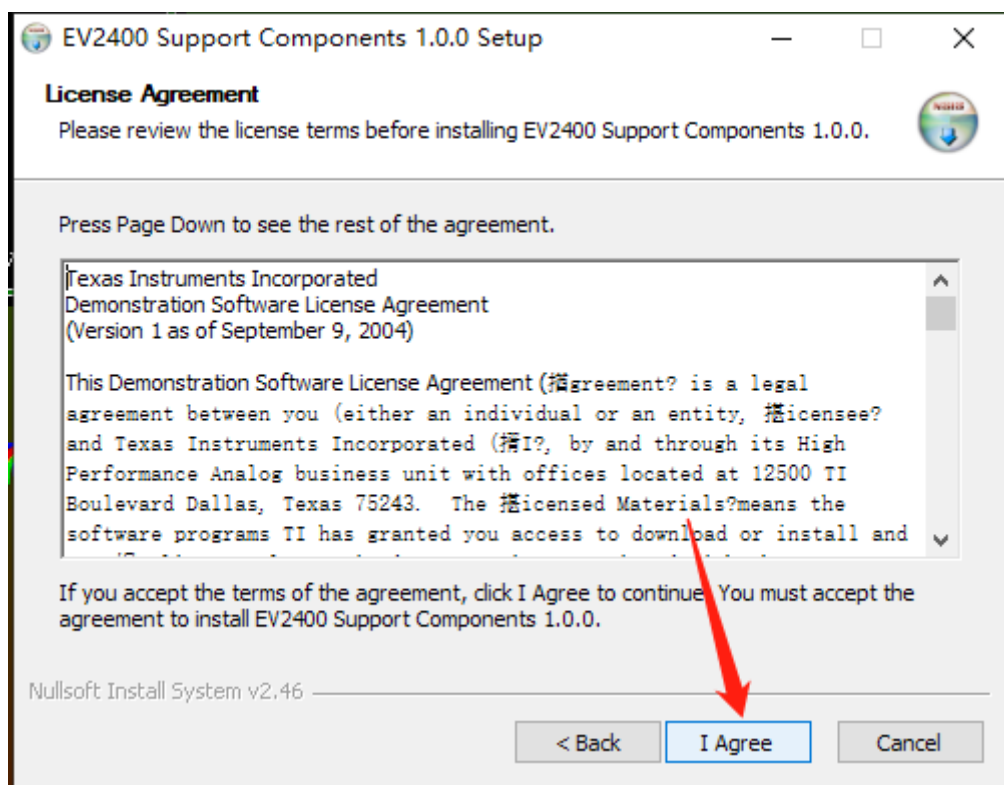
安装驱动程序，双击安装包



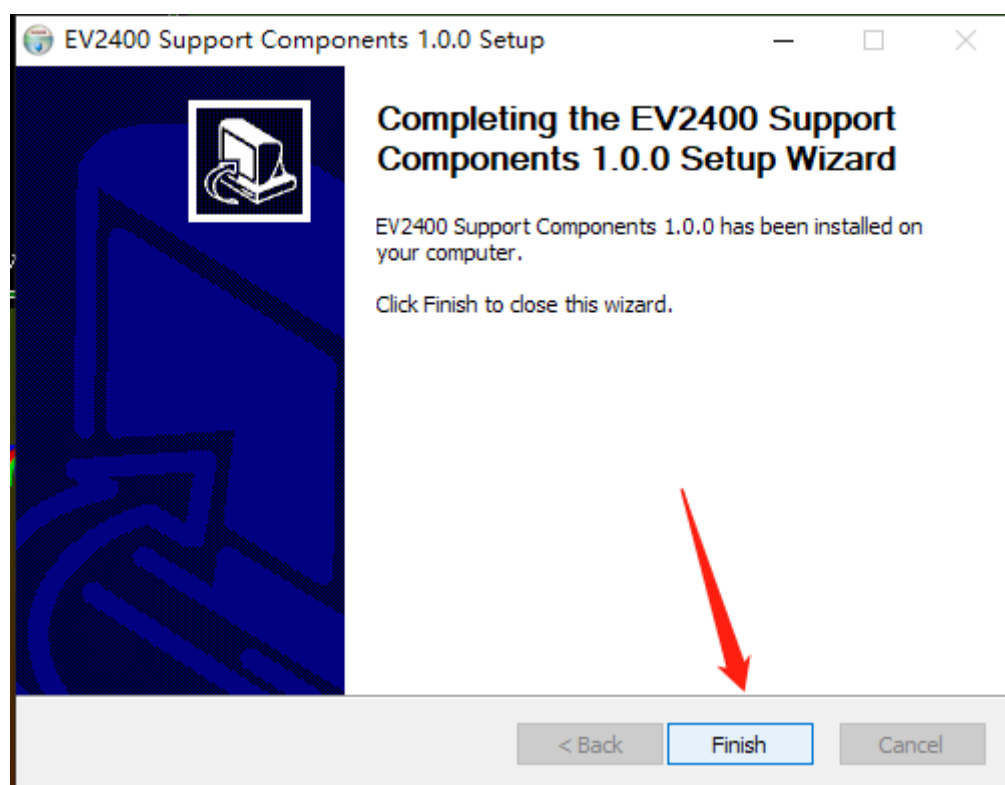
下一步



同意安装协议，点击后直接开始安装



安装完成



好了现在安装好了软件。

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### 三、开始调试

这里以 EV2400 对应御 air2 为例，其他型号会给出相应数据、电池接口定义资料包，对应修改、连接即可。

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## 1、

### EV2400 与电池连线概述

我们最常用的接口 SMB。I2C、。HDQ其中 BQ34XXX 等使用 HDQ 口、BQ27XXX 等使用 I2C 口，我们大疆无人机根据机型不同目前仅  
需链接 SMB 口或 I2C 即可。

### EV2400 与电池AIR2连线

使用EV2400 的 SMB 端口，我们需要的是 SMB 端口的SmBD、SmBC和GND，接线时切记任何线都不能连接到电池的正端（电池正端电压往往较高且电流较大，任何 USB 电子设备都扛不住）

AIR2需要接EV2400上面第一排中间三根针, SmBD, SmBC, GND。

不同型号电池连线不同，根据教程内文件夹图接线





AIR2电池上通信定义如上图，接电池端口的GND, SmBD, SmBC。

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## 2、软件的操作

### (1) Battery Management Studio 软件设置

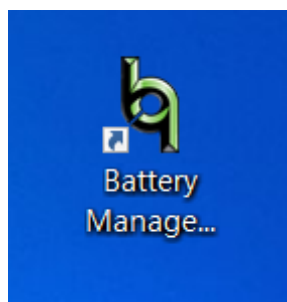
御 AIR2 的电池密码和芯片型号如下。

解封密码 ccdf7ee0

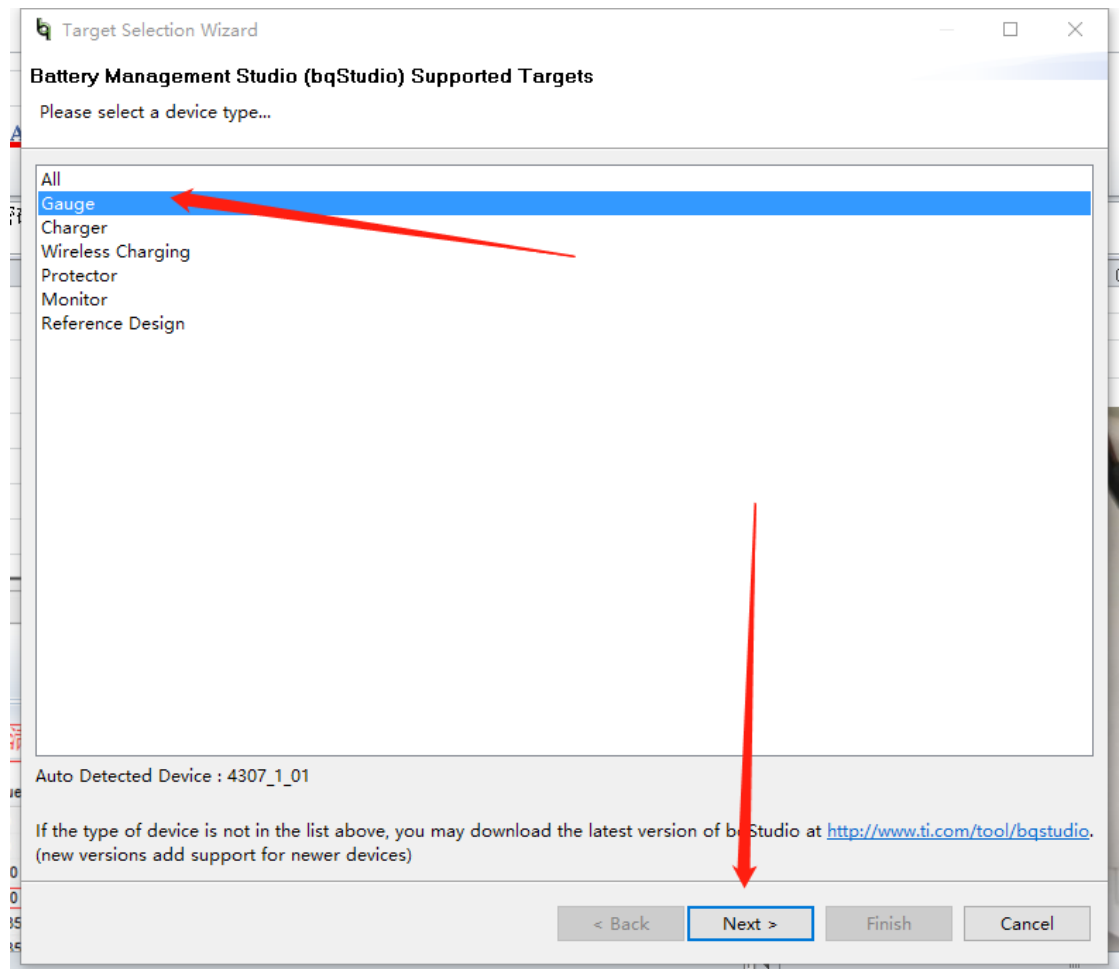
完全访问密码 E0BCBF17

芯片型号数据包 4500\_2\_06-bq40z50R2

双击打开

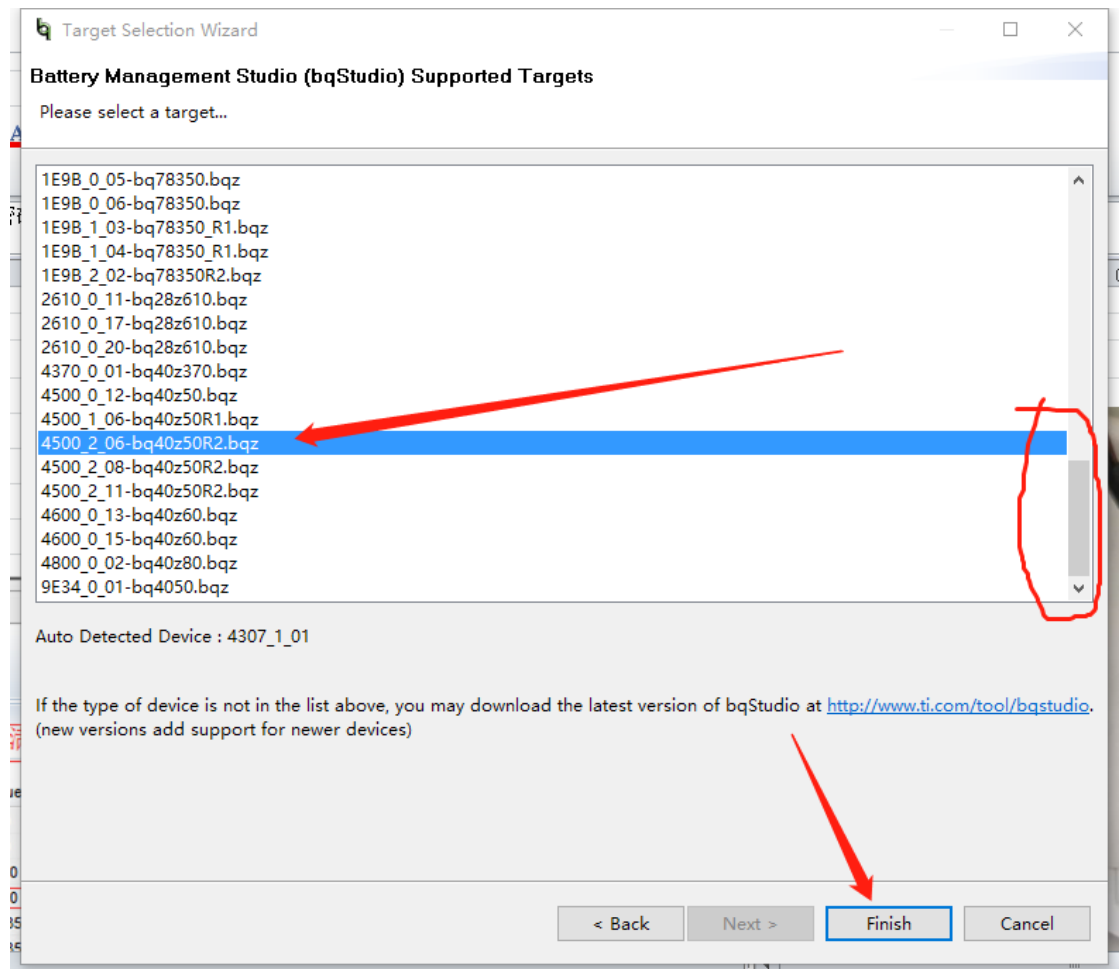


点击 Gauge，然后点 NEXT

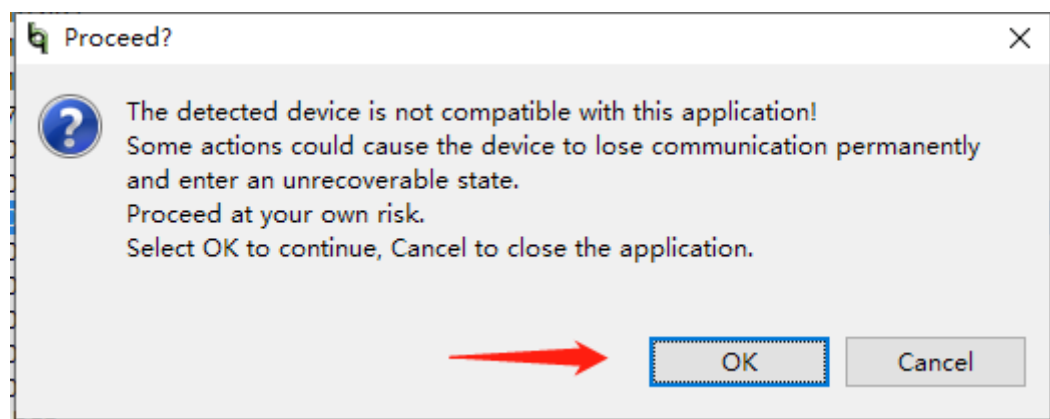


向下拖，选择上面给出的芯片型号数据包

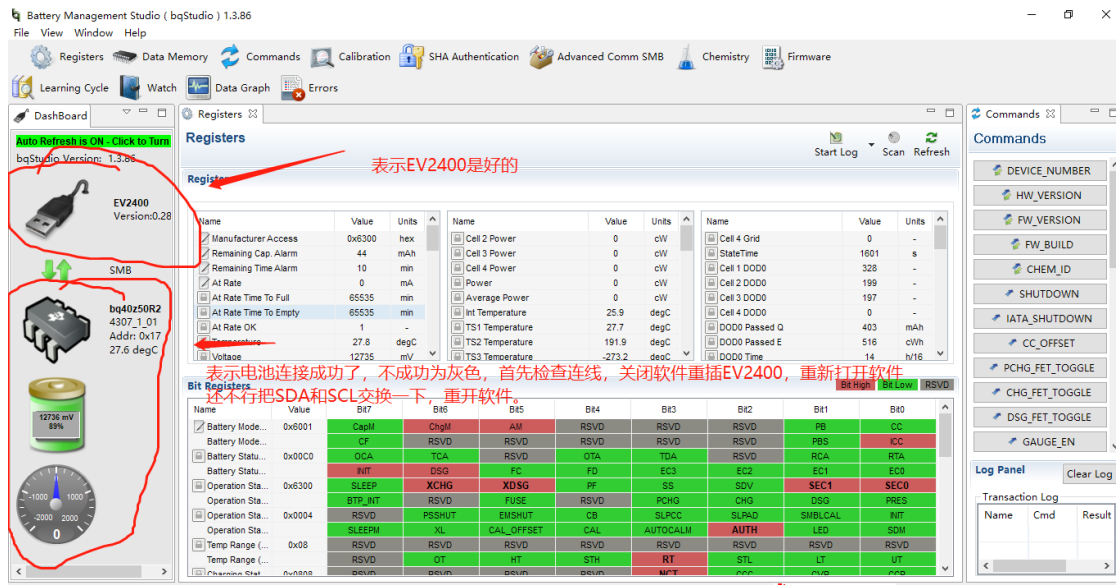
4500\_2\_06-bq40z50R2，点击 Finish。



不用管，点 OK



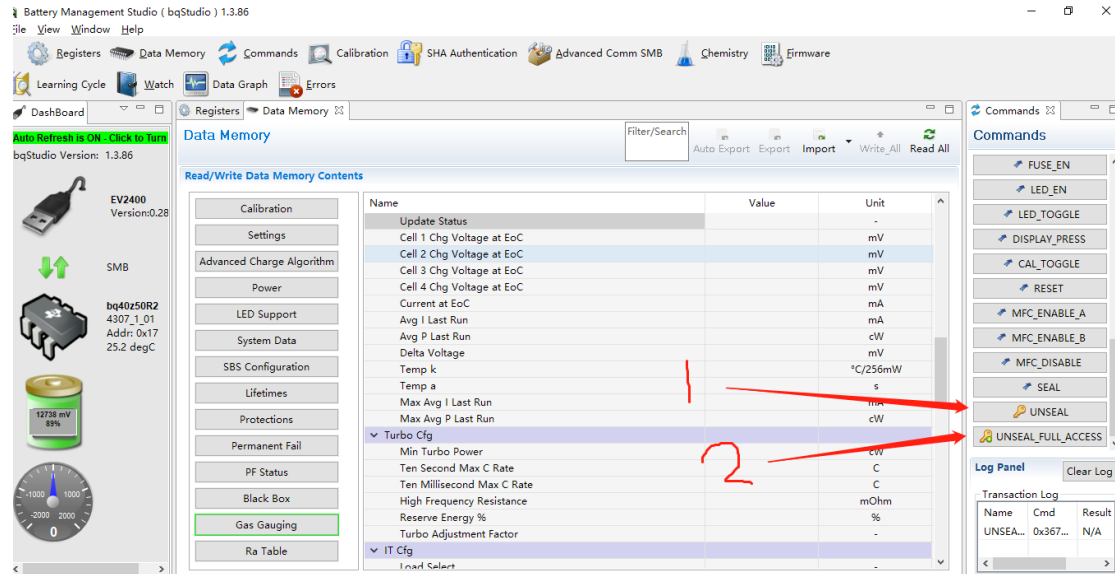
软件打开界面如下



上图中左边USB端口为黑色表面2400正常，下面的芯片为黑色，表面已经通信上电池主板，可以进行下一步操作。

## (2) 解封电池

分两步，第一步按照箭头 1 所示点击软件右边 UNSERIAL 按钮解封电池。



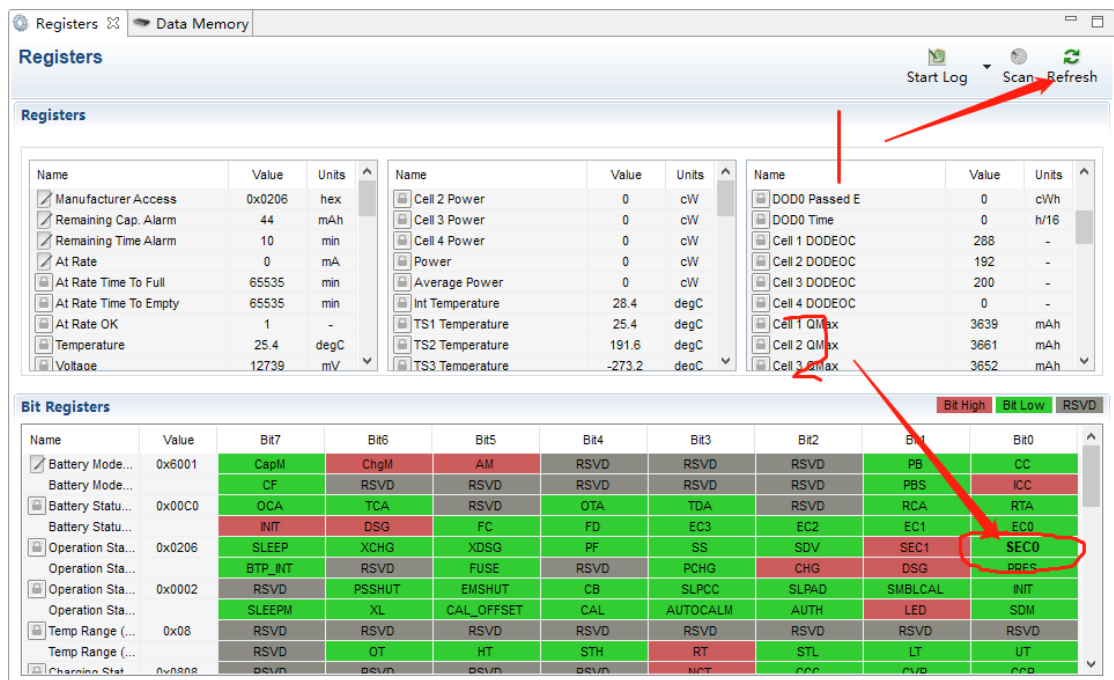
输入前文提供的解封密码。点击 ok。

## UNSEAL Device

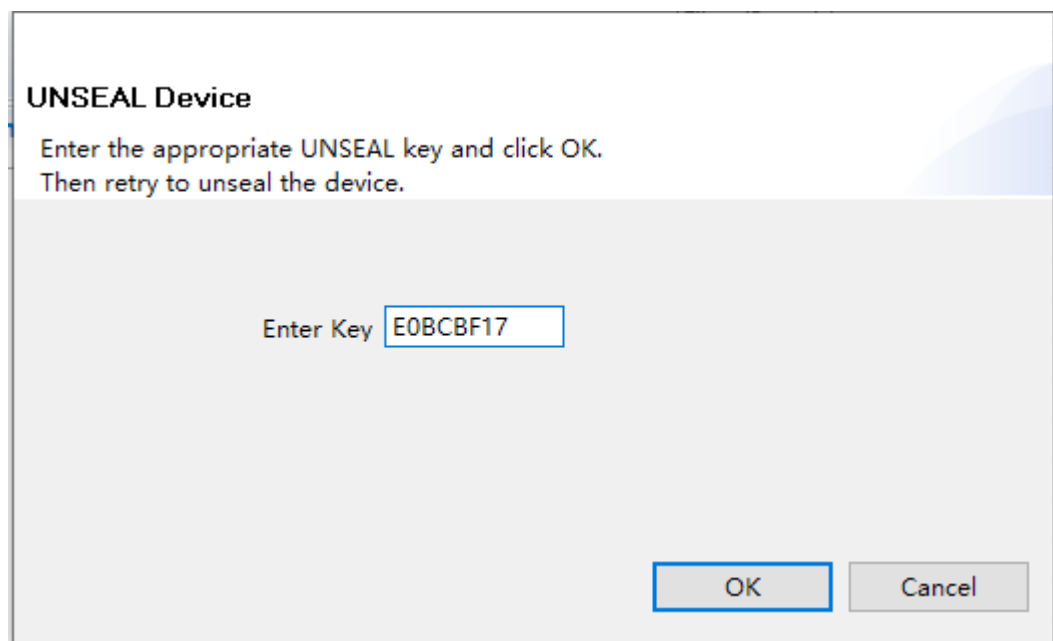
Enter the appropriate UNSEAL key and click OK.  
Then retry to unseal the device.

Enter Key

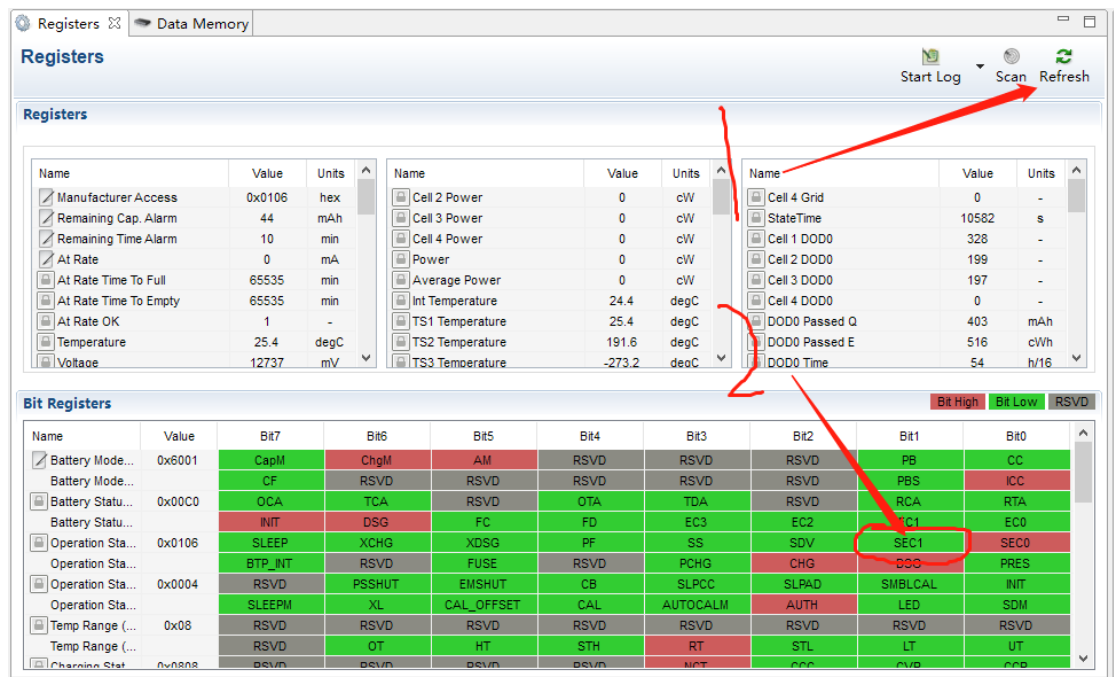
解封电池后点击 Refresh 刷新数据，我们可以看到 SECO 为绿色代表成功。



第二步按照箭头 2 所示点击软件右边 **UNSERAL\_FULL\_ACCESS** 按钮  
解锁电池完全访问功能。输入前文提供的完全访问密码。点击 **ok**。  
此处速度要快，在第一步完成后 4s 内完成。



解除电池完全访问锁后点击 **Refresh** 刷新数据，我们可以看到 **SEC1**  
变为绿色代表成功。



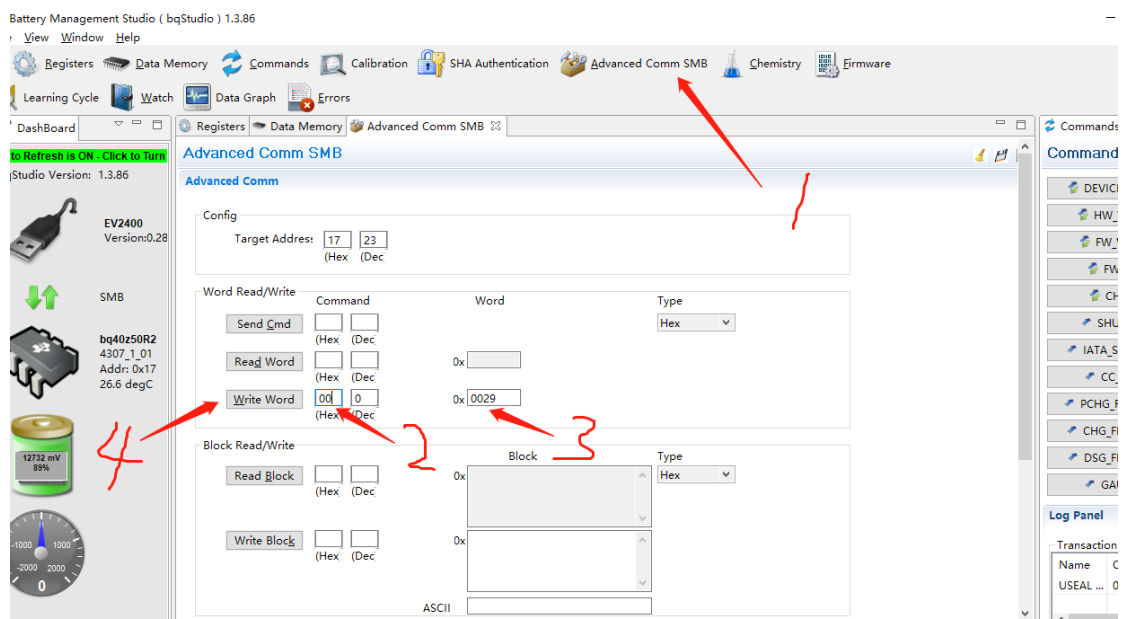
如不成功请从头开始。

### (3) 电池不能充放解锁

如果没有此情况忽略此节。

点击 Advanced Comm SMB，输入地址 00 和命令 0029，点击 Write Word。

这个命令是用来重置保护的。





电池不亮灯处理方法：如下图修改数据为：01.23.45.67

Calibration

Settings

Advanced Charge Algorithm

Power

LED Support

System Data

SBS Configuration

Lifetimes

Protections

Permanent Fail

PF Status

Black Box

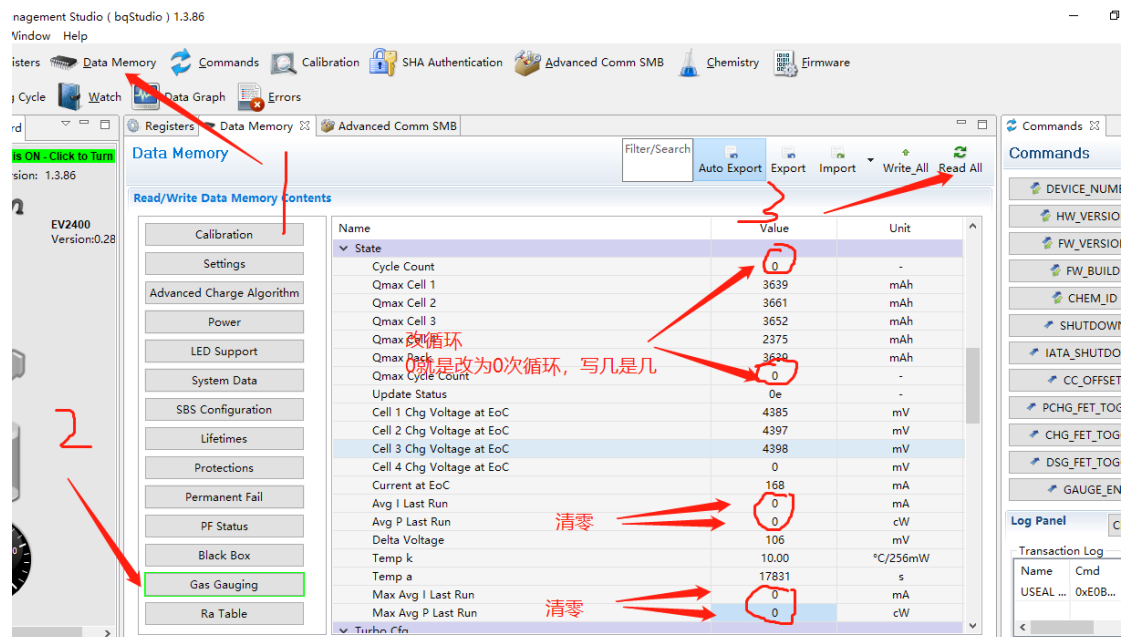
Gas Gauging

Name	Value	Unit
Manufacturer Info Block A20	74	Hex
Manufacturer Info Block A21	75	Hex
Manufacturer Info Block A22	76	Hex
Manufacturer Info Block A23	77	Hex
Manufacturer Info Block A24	7a	Hex
Manufacturer Info Block A25	78	Hex
Manufacturer Info Block A26	79	Hex
Manufacturer Info Block A27	30	Hex
Manufacturer Info Block A28	31	Hex
Manufacturer Info Block A29	32	Hex
Manufacturer Info Block A30	33	Hex
Manufacturer Info Block A31	34	Hex
Manufacturer Info Block A32	02	Hex
Manufacturer Info B		
Manufacturer Info Block B01	01	Hex
Manufacturer Info Block B02	23	Hex
Manufacturer Info Block B03	45	Hex
Manufacturer Info Block B04	67	Hex
Integrity		
Static DE Signature	0000	Hex

(4) 修改电池循环次数

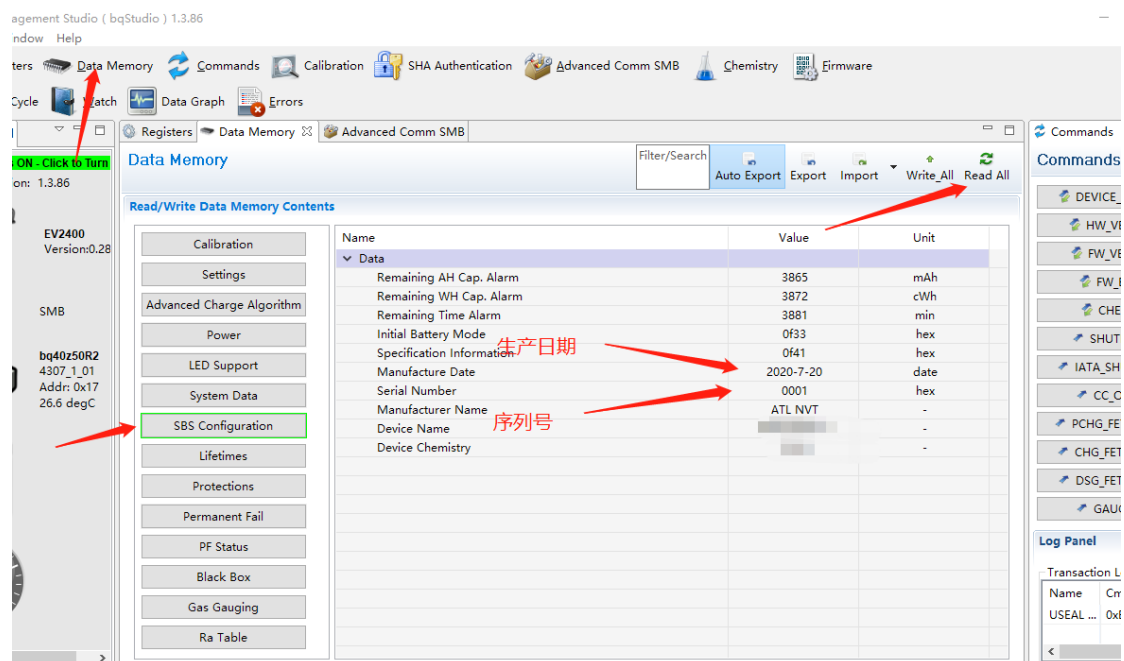
点击 Data Memory，点击 Gas Gauging，点击 Read All。在 Cycle 和 Qmax Cycle Count 中直接修改，点击回车确认，此处 12 表示将电 池循环次数改为 12 次。

如果此处没有数据，点击 **Read All** 可以刷新，如还没有检查是否完全访问。



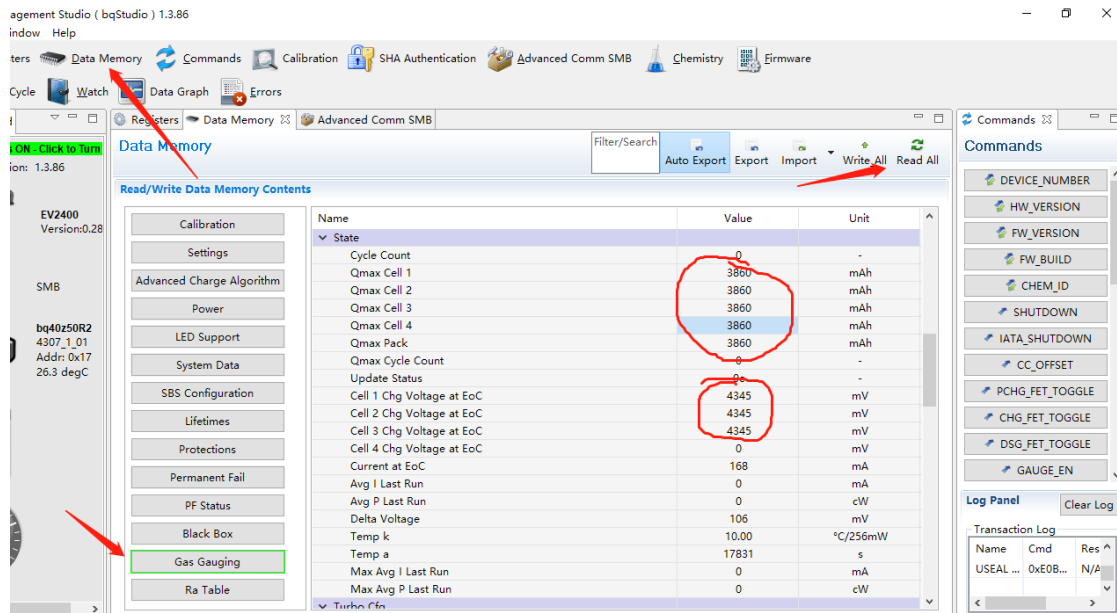
## (5) 修改电池生产日期

点击 **Data Memory**，点击 **Gas Gauging**，点击 **Read All**。



## （6）修改电池容量

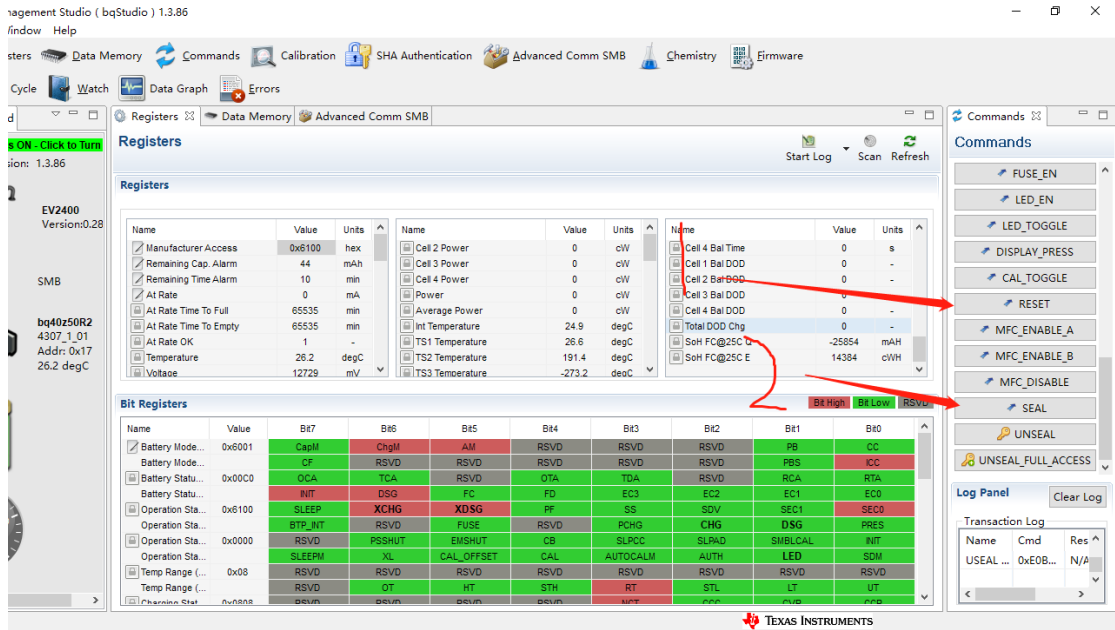
扩容之后 Qmax 根据实际情况修改为新的容量。Cell \* Chg Voltage at EoC 修改为如图所示。



## （7）重启并关闭电池完全访问

这一步不能忘，不然有可能飞机无法识别电池。

点击 RESET，等几秒。点击 SEAL，在等几秒。完成。

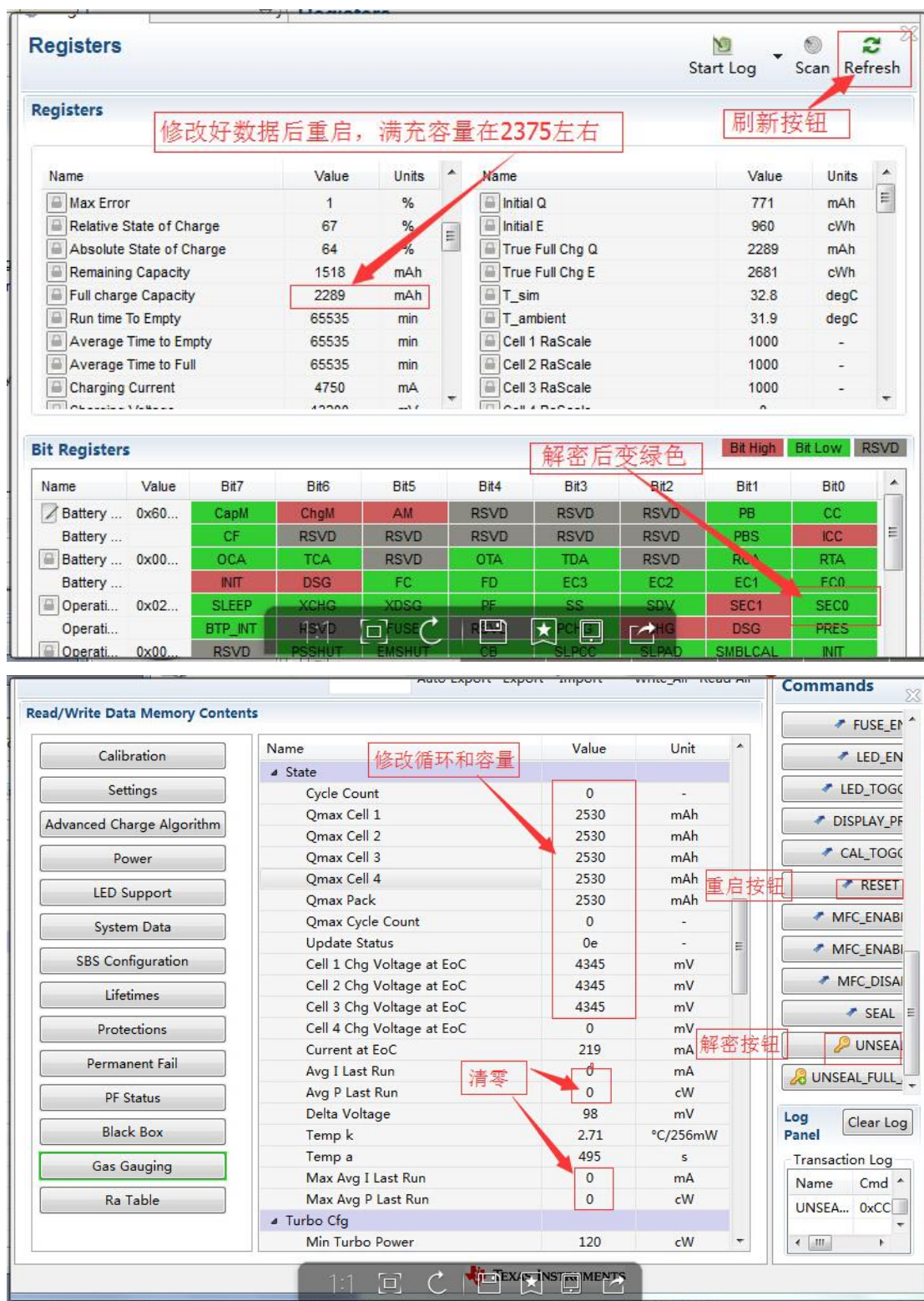


## (8) 其他机型数据与密码

以下数据来源于网络，网络中的接线图不清晰已重新整理。

### a. 御 Air1 数据

解封密码 ccdf7ee0
完全访问密码 E0BCBF17
芯片型号数据包 4500_2_06-bq40z50R2



按键没反应，灯不亮就修改了下面四个数据 01 23 45 67

Calibration	Name	Value	Unit
Settings	Manufacturer Info Block A20	74	Hex
Advanced Charge Algorithm	Manufacturer Info Block A21	75	Hex
Power	Manufacturer Info Block A22	76	Hex
LED Support	Manufacturer Info Block A23	77	Hex
<b>System Data</b>	Manufacturer Info Block A24	7a	Hex
SBS Configuration	Manufacturer Info Block A25	78	Hex
Lifetimes	Manufacturer Info Block A26	79	Hex
Protections	Manufacturer Info Block A27	30	Hex
Permanent Fail	Manufacturer Info Block A28	31	Hex
PF Status	Manufacturer Info Block A29	32	Hex
Black Box	Manufacturer Info Block A30	33	Hex
Gas Gauging	Manufacturer Info Block A31	34	Hex
Ra Table	Manufacturer Info Block A32	02	Hex
	Manufacturer Info Block B01	01	Hex
	Manufacturer Info Block B02	23	Hex
	Manufacturer Info Block B03	45	Hex
	Manufacturer Info Block B04	67	Hex
	Integrity		
	Static DF Signature	0000	hex
	Static Chem DF Signature	7630	hex
	All DF Signature	0000	hex

Calibration	Name	Value	Unit
<b>Settings</b>	Configuration		
Advanced Charge Algorithm	Charging Configuration	12	hex
Power	FET Options	35	hex
LED Support	Sbs Gauging Configuration	00	hex
System Data	Sbs Configuration	22	hex
SBS Configuration	Auth Config	00	hex
Lifetimes	Power Config	29	hex
Protections	IO Config	00	hex
Permanent Fail	LED Configuration	001f	hex
PF Status	Temperature Enable	7a	hex
Black Box	Temperature Mode	47	hex
Gas Gauging	DA Configuration	477c	hex
Ra Table	SOC Flag Config A	3300	hex
	SOC Flag Config B	00	hex
	Balancing Configuration	1b	hex
	IT Gauging Configuration	0000	hex
	IT Gauging Ext	0000	hex
	Fuse		
	PF Fuse A	00	hex
	PF Fuse B	21	hex
	PF Fuse C	00	hex
	PF Fuse D	22	hex
	Min Blow Fuse Voltage	15104	mV





Registers

Start Log Scan Refresh

Registers

改完数据，重启后满充容量在3850左右

刷新按钮

Name	Value	Units	Name	Value	Units
Relative State of Charge	99	%	Initial Q	60	mAh
Absolute State of Charge	99	%	Initial E	103	cWh
Remaining Capacity	3800	mAh	True Full Chg Q	3860	mAh
Full charge Capacity	3860	mAh	True Full Chg E	6017	cWh
Run time To Empty	65535	min	T_sim	29.3	degC
Average Time to Empty	65535	min	T_ambient	29.2	degC
Average Time to Full	65535	min	Cell 1 RaScale	1000	-
Charging Current	2200	mA	Cell 2 RaScale	1000	-
Charging Voltage	17600	mV	Cell 3 RaScale	1000	-
Cycle Count	0	-	Cell 4 RaScale	1000	-
Maximum Turbo Power	0	cW	Cell 1 ConnDes	0	mOhm

解密后会变成绿色

Bit High Bit Low RSVD

Name	Value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Battery Mode - Read/Write	0x60	ChgM	AM	RSVD	RSVD	RSVD	PB	CC	
Battery ...		RSVD	RSVD	RSVD	RSVD	RSVD	PBS	ICC	
Battery ...		TCA	RSVD	OTA	TDA	RSVD	EC1	EC0	
Operati...	0x03...	INIT	DSG	FC	FD	EC3	EC2	SEC1	SEC0

Read/Write Data Memory Contents

Calibration Settings Advanced Charge Algorithm Power LED Support System Data SBS Configuration Lifetimes Protections Permanent Fail PF Status Black Box Gas Gauging Ra Table

Name	Value	Unit
Cycle Count	0	-
Qmax Cell 1	4260	mAh
Qmax Cell 2	4260	mAh
Qmax Cell 3	4260	mAh
Qmax Cell 4	4260	mAh
Qmax Pack	4260	mAh
Qmax Cycle Count	0	-
Update Status	0e	-
Cell 1 Chg Voltage at EoC	4345	mV
Cell 2 Chg Voltage at EoC	4345	mV
Cell 3 Chg Voltage at EoC	4345	mV
Cell 4 Chg Voltage at EoC	4345	mV
Current at EoC	181	mA
Avg I Last Run	0	mA
Avg P Last Run	0	cW
Delta Voltage	140	mV
Temp k	3.14	°C/256mW
Temp a	2048	s
Max Avg I Last Run	0	mA
Max Avg P Last Run	0	cW
Turbo Cfg		
Min Turbo Power	56	cW

修改循环和容量

清零

清零

TEXAS INSTRUMENTS

按键没反应，灯不亮就修改了下面四个数据 01 23 45 67



Calibration	Name	Value	Unit
Settings	Manufacturer Info Block A20	74	Hex
Advanced Charge Algorithm	Manufacturer Info Block A21	75	Hex
Power	Manufacturer Info Block A22	76	Hex
LED Support	Manufacturer Info Block A23	77	Hex
<b>System Data</b>	Manufacturer Info Block A24	7a	Hex
SBS Configuration	Manufacturer Info Block A25	78	Hex
Lifetimes	Manufacturer Info Block A26	79	Hex
Protections	Manufacturer Info Block A27	30	Hex
Permanent Fail	Manufacturer Info Block A28	31	Hex
PF Status	Manufacturer Info Block A29	32	Hex
Black Box	Manufacturer Info Block A30	33	Hex
Gas Gauging	Manufacturer Info Block A31	34	Hex
Ra Table	Manufacturer Info Block A32	02	Hex
	Manufacturer Info B		
	Manufacturer Info Block B01	01	Hex
	Manufacturer Info Block B02	23	Hex
	Manufacturer Info Block B03	45	Hex
	Manufacturer Info Block B04	67	Hex
	Integrity		
	Static DF Signature	0000	hex
	Static Chem DF Signature	7630	hex
	All DF Signature	0000	hex

Calibration	Name	Value	Unit
<b>Settings</b>	Configuration		
Advanced Charge Algorithm	Charging Configuration	12	hex
Power	FET Options	35	hex
LED Support	Sbs Gauging Configuration	00	hex
System Data	Sbs Configuration	22	hex
SBS Configuration	Auth Config	00	hex
Lifetimes	Power Config	29	hex
Protections	IO Config	00	hex
Permanent Fail	LED Configuration	001f	hex
PF Status	Temperature Enable	7a	hex
Black Box	Temperature Mode	47	hex
Gas Gauging	DA Configuration	477c	hex
Ra Table	SOC Flag Config A	3300	hex
	SOC Flag Config B	00	hex
	Balancing Configuration	1b	hex
	IT Gauging Configuration	0000	hex
	IT Gauging Ext	0000	hex
	Fuse		
	PF Fuse A	00	hex
	PF Fuse B	21	hex
	PF Fuse C	00	hex
	PF Fuse D	22	hex
	Min Block Fuse Voltage	15104	mV

### c. 晓数据

晓数据 电池是 1480mah

解封密码 ccdf7ee0
完全访问密码 E0BCBF17
芯片型号数据包 4500_2_06-bq40z50R2

Read/Write Data Memory Contents		
Calibration	Name	Value Unit
Settings	State	
Advanced Charge Algorithm	Cycle Count	0 -
Power	Qmax Cell 1	1560 mAh
LED Support	Qmax Cell 2	1560 mAh
System Data	Qmax Cell 3	1560 mAh
SBS Configuration	Qmax Cell 4	1560 mAh
Lifetimes*	Qmax Pack	1560 mAh
Protections	Qmax Cycle Count	0 -
Permanent Fail	Update Status	0e -
PF Status	Cell 1 Chg Voltage at EoC	4345 mV
Black Box	Cell 2 Chg Voltage at EoC	4345 mV
Gas Gauging	Cell 3 Chg Voltage at EoC	4345 mV
容量页面 Ra Table	Cell 4 Chg Voltage at EoC	0 mV
	Current at EoC	130 mA
	Avg I Last Run	0 mA
	Avg P Last Run	0 cW
	Delta Voltage	37 mV
	Temp k	10.00 °C/256mW
	Temp a	4853 s
	Max Avg I Last Run	0 mA
	Max Avg P Last Run	0 cW
	Turbo Cfg	
	Min Turbo Power	120 cW
	Ten Second Max C Rate	-0.1 C
	Ten Millisecond Max C Rate	-0.1 C

### d. 御 mini1 数据

解封密码 ccdf7ee0
完全访问密码 E0BCBF17

## 芯片型号数据包 4500\_2\_06-bq40z50R2

接口和晓排列一致，参考晓。

Name	Value	Units	Name	Value	Units	Name	Value	Units
Average Current	0	mA	Cell 2 Power	0	cW	Cell 4 Grid	0	-
Max Error	1	%	Cell 3 Power	0	cW	StateTime	433463	s
Relative State of Charge	13	%	Cell 4 Power	0	cW	Cell 1 DOD0	12811	-
Absolute State of Charge	12	%	Power	0	cW	Cell 2 DOD0	12830	-
Remaining Capacity	279	mAh	Average Power	0	cW	Cell 3 DOD0	0	-
Full charge Capacity	2321	mAh	Int Temperature	24.0	degC	Cell 4 DOD0	0	-
Run time To Empty	65535	min	TS1 Temperature	23.9	degC	DOD0 Passed Q	0	mAh
Average Time to Empty	65535	min	TS2 Temperature	-53.5	degC	DOD0 Passed E	0	cWh
Average Time to Full	65535	min	TS3 Temperature	-273.2	degC	DOD0 Time	6	h/16
Charging Current	4750	mA	TS4 Temperature	-273.2	degC	Cell 1 DODEOC	0	-
Charging Voltage	8400	mV	Cell Temperature	23.9	degC	Cell 2 DODEOC	0	-
Cycle Count	3	-	FET Temperature	-273.2	degC	Cell 3 DODEOC	0	-

Name	Value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Battery Mode (...)	0x6001	CapM	ChgM	AM	RSVD	RSVD	RSVD	RSVD	CC
Battery Mode (...)	0x02C0	CF	RSVD	RSVD	RSVD	RSVD	RSVD	PBS	ICC
Battery Status ...	0x02C0	OCA	TCA	RSVD	OTA	TDA	RSVD	RCA	RTA
Battery Status ...	0x0206	INIT	DSG	FC	FD	EC3	EC2	EC1	EC0
Operation Stat...	0x0206	SLEEP	XCHG	XDSG	PF	SS	SDV	SEC1	SEC0
Operation Stat...	0x0206	BTP_INT	RSVD	FUSE	RSVD	PCHG	CHG	DSG	PRES

Name	Value	Unit
Clear % RSOC Threshold	16	%
State		
Cycle Count	3	-
Qmax Cell 1	2611	mAh
Qmax Cell 2	2612	mAh
Qmax Cell 3	2500	mAh
Qmax Cell 4	2500	mAh
Qmax Pack	2611	mAh
Qmax Cycle Count	3	-
Update Status	0e	-
Cell 1 Chg Voltage at EoC	4201	mV
Cell 2 Chg Voltage at EoC	4199	mV
Cell 3 Chg Voltage at EoC	0	mV
Cell 4 Chg Voltage at EoC	0	mV
Current at EoC	88	mA
Avg I Last Run	-4842	mA
Avg P Last Run	-3501	cW
Delta Voltage	66	mV
Temp k	2.76	°C/256mW
Temp a	1093	s
Max Avg I Last Run	-6476	mA
Max Avg P Last Run	-4550	cW

System Data	Manufacturer Info Block A27	30	Hex
SBS Configuration	Manufacturer Info Block A28	31	Hex
Lifetimes	Manufacturer Info Block A29	32	Hex
Protections	Manufacturer Info Block A30	33	Hex
Permanent Fail	Manufacturer Info Block A31	34	Hex
PF Status	Manufacturer Info Block A32	02	Hex
Black Box	Manufacturer Info Block B01	01	Hex
Gas Gauging	Manufacturer Info Block B02	23	Hex
	Manufacturer Info Block B03	45	Hex
	Manufacturer Info Block B04	67	Hex
	Integrity		
	Static DF Signature	0000	hex

## e.悟 1 数据

此数据作者 Harold\_wang 2019-05-28 ver01，感谢。

解封密码 351B6c15
完全访问密码
芯片型号数据包 4500_2_06-bq40z50R2
如果密码不对尝试用御 air2 密码或者悟 2 密码

# 过充-过放保护异常处理

过充-过放保护异常处理

Battery Management Studio (bqStudio) 1.3.56

File View Window Help

Registers Data Memory Commands Calibration Advanced Comm Golden Image

Click this button

Advanced Comm I2C

I2C Master Control Panel

Byte Read/Write

I2C Address (Hex) aa

Start Register (Hex) 00

Bytes to Write (Hex) 1712

Write

Number of Bytes to Read (Decimal)

Read

Transaction Log

TimeStamp	Rd/Wr	Address	Register	Length	Data
-----------	-------	---------	----------	--------	------

写入以下命令:  
2673 → Write  
1712 → Write  
2100 → Write  
4100 → Write  
结束操作

此处按图片参数输入

Commands

- STATIC\_CHEM\_CHKSUM
- ALL\_DF\_CHKSUM
- STATIC\_DF\_CHKSUM
- SEALED
- IT\_ENABLE
- CAL\_ENABLE
- RESET
- EXIT\_CAL
- ENTER\_CAL
- OFFSET\_CAL
- UNSEAL
- UNSEAL\_FULL\_ACCESS

Log Panel

Clear Log

Transaction Log

Name	Cmd	Result
------	-----	--------

电量百分比不准，检查 Fuel Gauging 里的 Design Capacity mAh 是

---

5450, Design

Capacity cWh 是 12996,

Qmax Pack 和 Learned Full Charge Capacity 都是 5450, 下一项是 14870, 下一项 3732, 电芯,重新插拔就正常

Name	Value	Unit
▾ Current Thresholds		
Dsg Current Threshold	50	mA
Chg Current Threshold	50	mA
Quit Current	20	mA
Dsg Relax Time	1	s
Chg Relax Time	60	s
▾ Design		
Design Capacity mAh	5450	mAh
Design Capacity cWh	12996	cWh
Design Voltage	3800	mV
▾ Cycle		
Cycle Count Percentage	75	%
▾ FD		
Set % RSOC Threshold	0	%
Clear % RSOC Threshold	5	%
▾ FC		
Set % RSOC Threshold	100	%
Clear % RSOC Threshold	95	%
▾ TD		
Set % RSOC Threshold	6	%
Clear % RSOC Threshold	8	%
▾ TC		
Set % RSOC Threshold	100	%

Name	Value	Unit
TC		
Set % RSOC Threshold	100	%
Clear % RSOC Threshold	95	%
State		
Cycle Count	2	-
Qmax Pack	4250	mAh
Learned Full Charge Capacity	4250	mAh
Dod at EDV2	14870	-
CEDV cfg		
EMF	3732	-
C0	98	-
R0	171	-
T0	4336	-
R1	416	-
TC	9	-
C1	0	-
Age Factor	0	-
Fixed EDV 0	3215	-
EDV 0 Hold Time	3	s
Fixed EDV 1	3414	-
EDV 1 Hold Time	3	s
Fixed EDV 2	3484	-
EDV 2 Hold Time	50	s
Battery Low %	7.00	%
Min Delta V Filter	10	mV
FCC Learn Up	512	mAh
FCC Learn Down	256	mAh
Learning Low Temp	119	0.1degC
Requested Learning cycle count	20	num
OverLoad Current	25000	mA
Self Discharge Rate	45	0.01%/day
Electronics Load	0	3uA
Near Full	200	mAh
Reserve Capacity	0	mAh

电压校准 下面列出了电压校准的相关信息：

- 测量电芯 1 与 1N 之间的电压并将该值输入 “应用的电芯 1 电压” (Applied Cell 1 Voltage) 字段，然后选中校准电压 (Calibrate Voltage) 框。
- 测量 BAT+ 与 BAT - 之间的电压并将该值输入 “应用的电池电压” (Applied Cell 1 Voltage) 字段，然后选中校准电池电压 (Calibrate Battery Voltage) 框。
- 测量 PACK+ 与 PACK - 之间的电压并将该值输入 “应用的电芯 1 电压” (Applied Cell 1 Voltage) 字段，然后

---

选中校准电池组电压 (Calibrate Pack Voltage) 框。如果不存在电压，则按下 FET\_EN 按钮（命令 (Commands) 面板上）以接通充电和放电场效应晶体管 (FET)。

- 按下校准电量监测计 (Calibrate Gas Gauge) 按钮以校准电压测量系统。
- 完成电压校准后，取消选中校准电压 (Calibrate Voltage) 框。

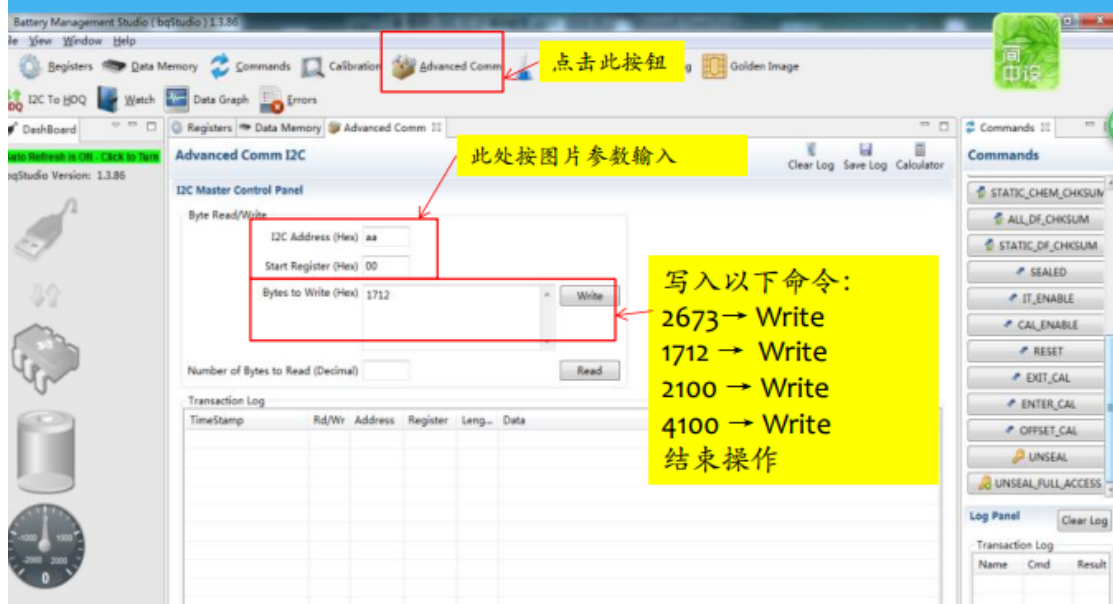
## f. 悟 2 数据

此数据作者 Harold \_ wang 2019-05-28 ver01，感谢。连接 EV2400 的 I2C 口。有两版电池，根据自身实际情况来。

解封密码 92be89d6
完全访问密码 d9b96a36
芯片型号数据包 0100-0-16-bq34z100g1



## 过充-过放保护异常处理



## 过充-过放保护异常处理

确认此处 FAS 和 SS 是否变为红色  
OK 取下，使用充电器进行充电测试。  
确认是否能正常充电。  
充电正常再上飞机测试确认是否正常。

※ 电池异常情况较多且原因复杂，并非使用此类方法都可以解决。

### g. 植保数据

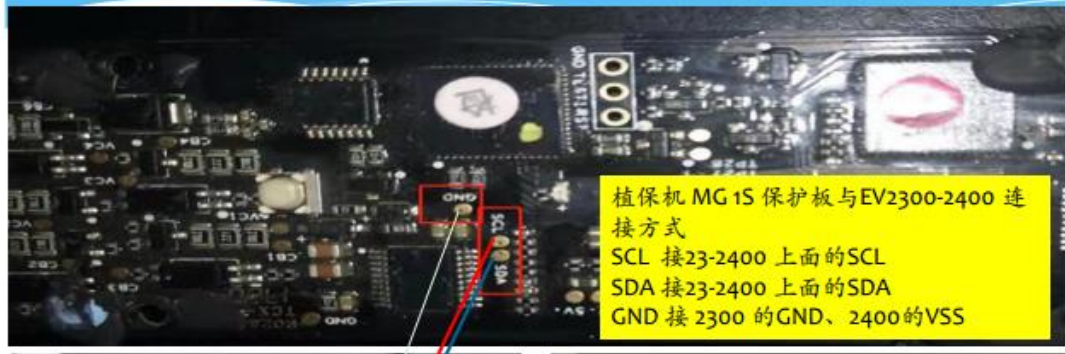
此数据作者 Harold\_wang 2019-05-28 ver01，感谢。连接 EV2400 的 I2C 口。EV2400 连线方法一端将接口插入 EV2400 的 i2c 口即 P O R T 2 口。V O U T 如果有连线建议打结，以防乱搭短路。

解封密码 92be89d6

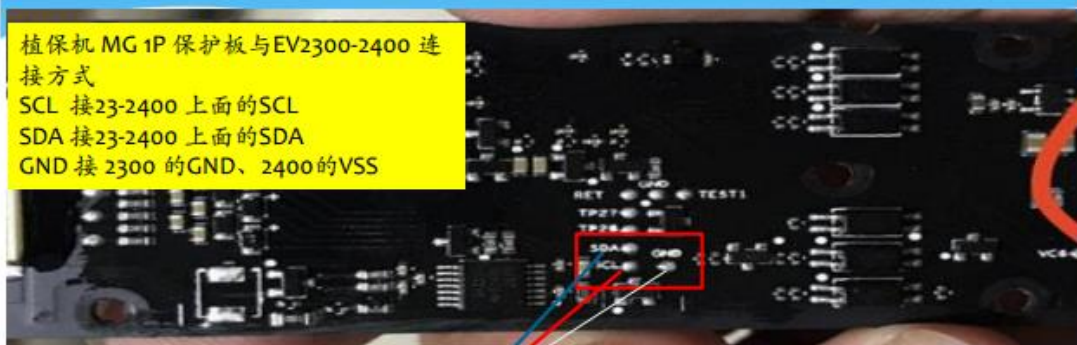
完全访问密码 d9b96a36

芯片型号数据包 0100-0-16-bq34z100g1

## EV2300-2400 与MG1S保护板连接



## EV2300-2400 与MG1P保护板连接



## EV2300-2400 与T16保护板连接



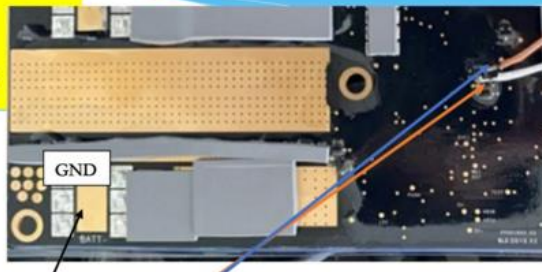
## EV2300-2400 与T20保护板连接

植保机 T20 保护板与EV2300-2400 连接方式

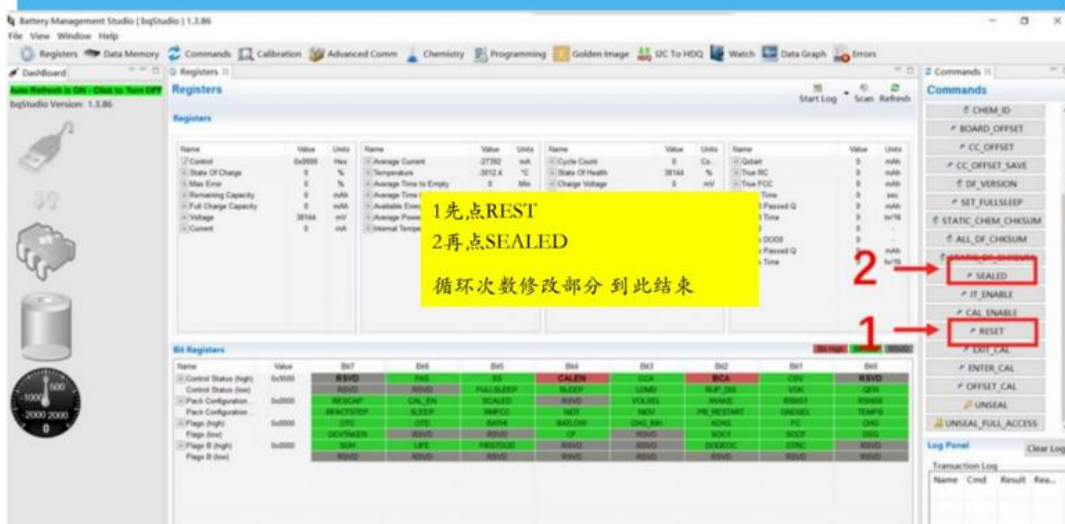
SCL 接23-2400 上面的SCL

SDA 接23-2400 上面的SDA

GND 接 2300 的GND、2400的VSS



## 结束后数据复位及确认



## 充放电异常硬件复位操作 电流没有输出



GND 与 RST 进行短接  
时间：2-3秒





对于植保机电池维修还有一个不确定因素，高端机型，电池主板上搭载一篇微处理器（MSP430），如果此片微处理器因掉电，过压，欠压出现程序损坏，此程序无法替换，上面的操作将无济于事，如果上述操作无法解锁电池，基本上是msp430损坏，无法修复（换芯片也没程序），只能宣布电池主板报废。

**（9）bq Evaluation Software 软件设置**

精灵 3 的电池密码和芯片型号如下。

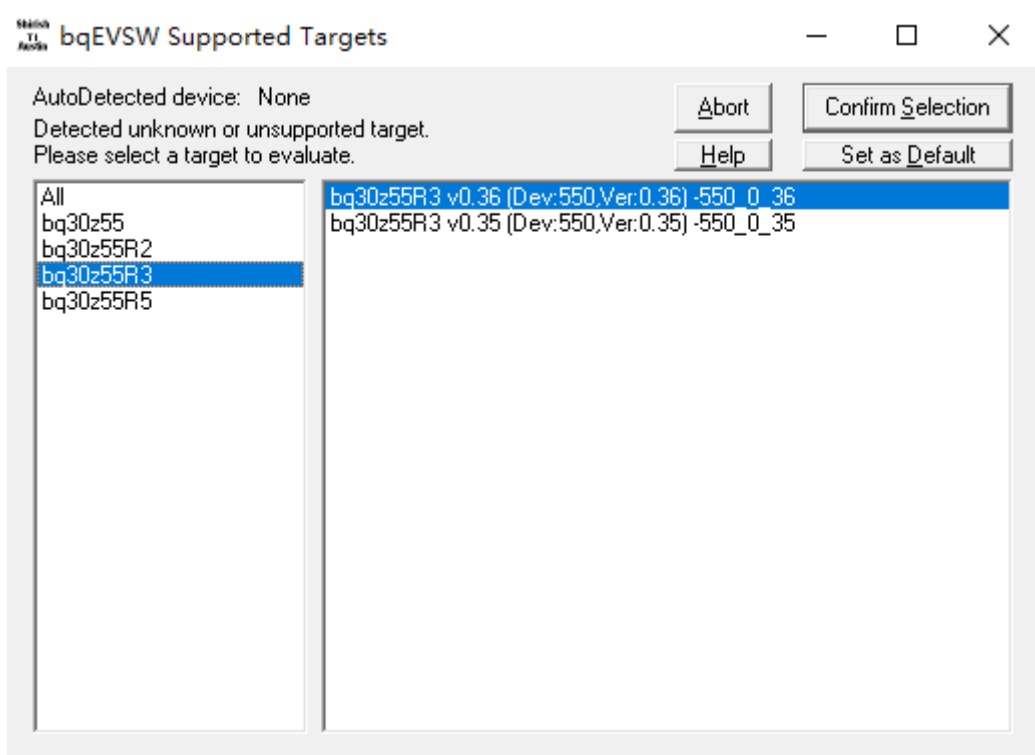
	解封密码	
	0310E6546051541D31584841B05C41A5	
	芯片型号数据包 bq30z55r3 0.36	

---

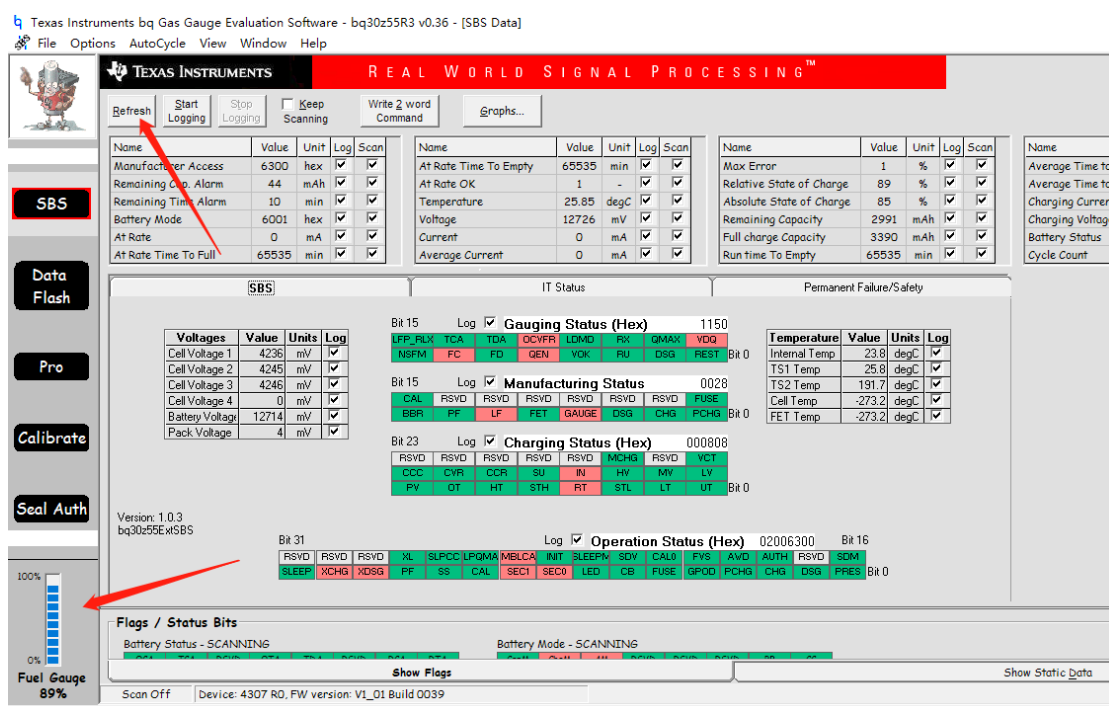
双击打开



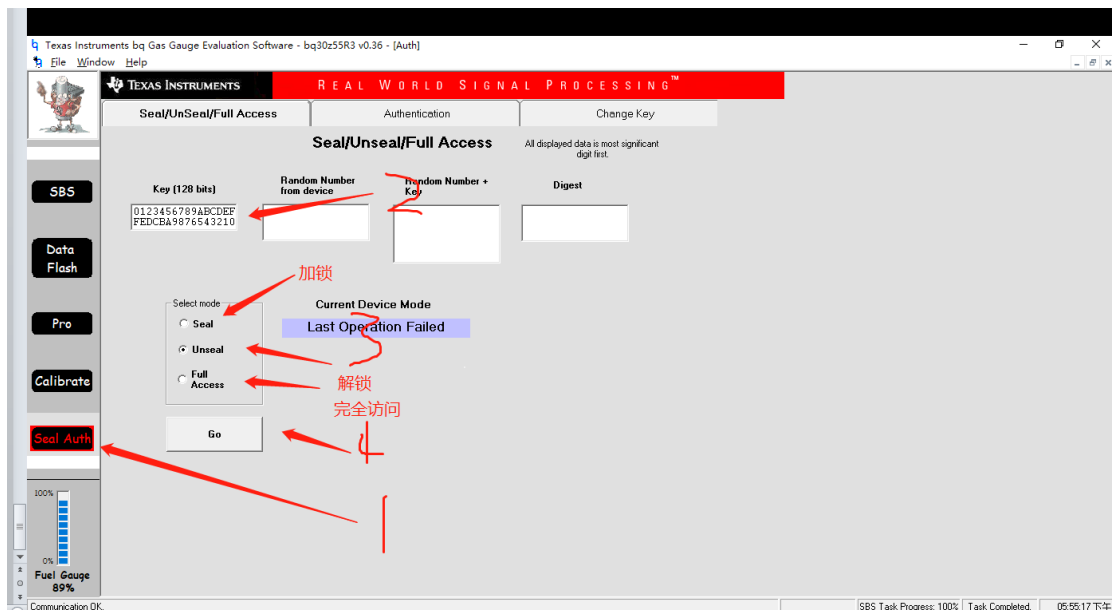
选择电池数据包，大多数情况可以自动识别  
解封电池



点击 Refresh，下图代表电池连接成功



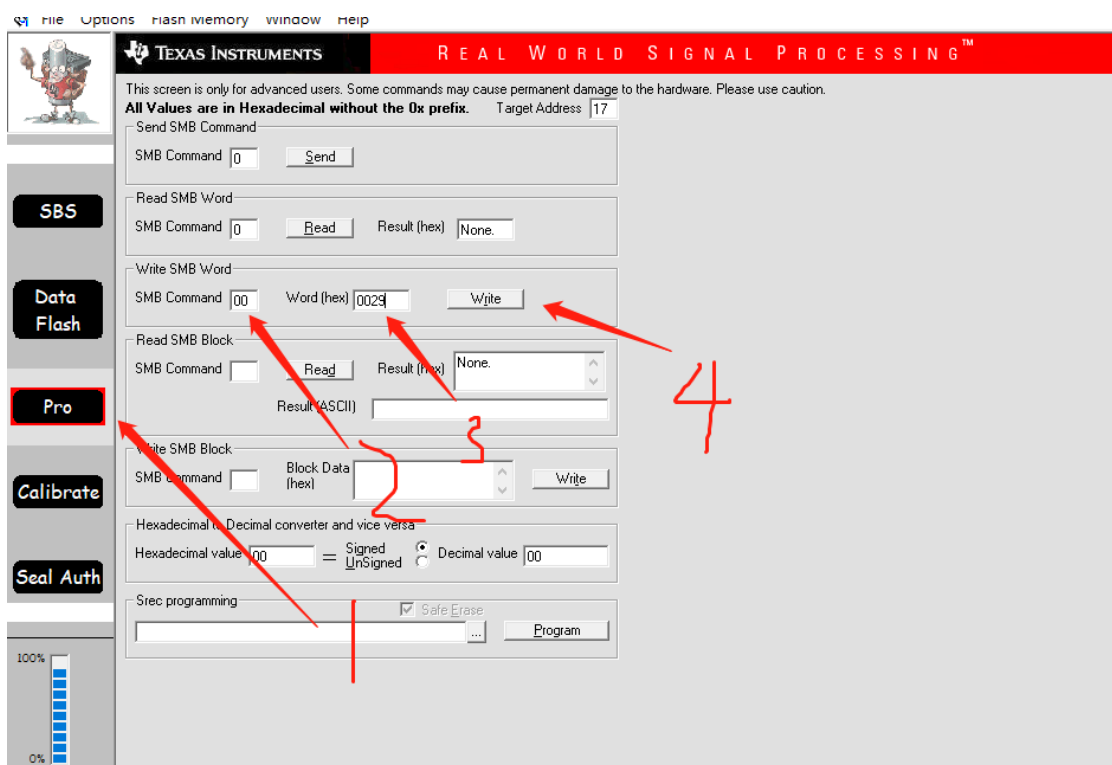
进入软件先接触访问限制



电池不能充放解锁

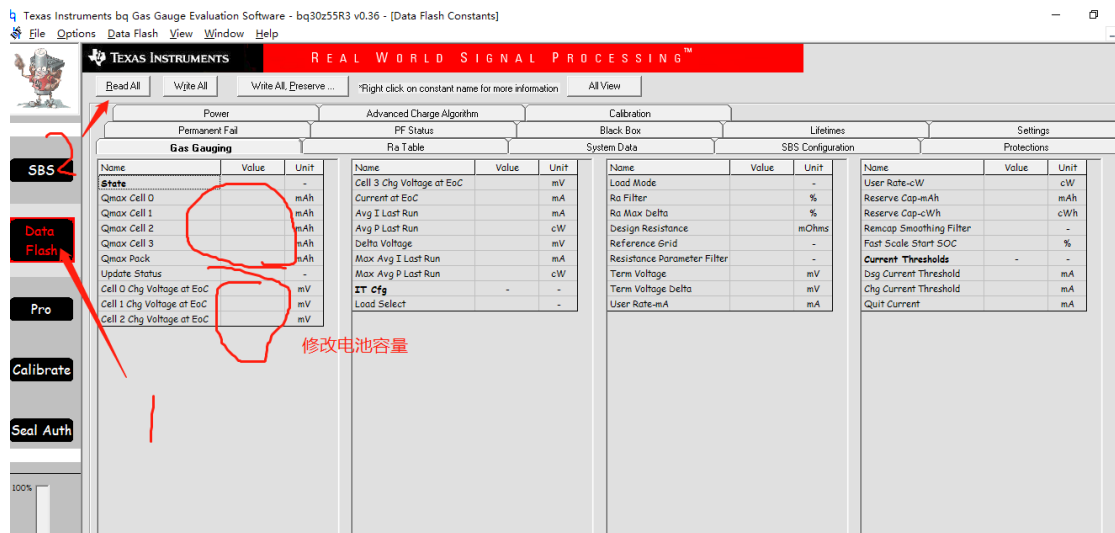
如果没有此情况忽略此节。

点击 PRO，输入地址 00 和命令 0029，点击 Write

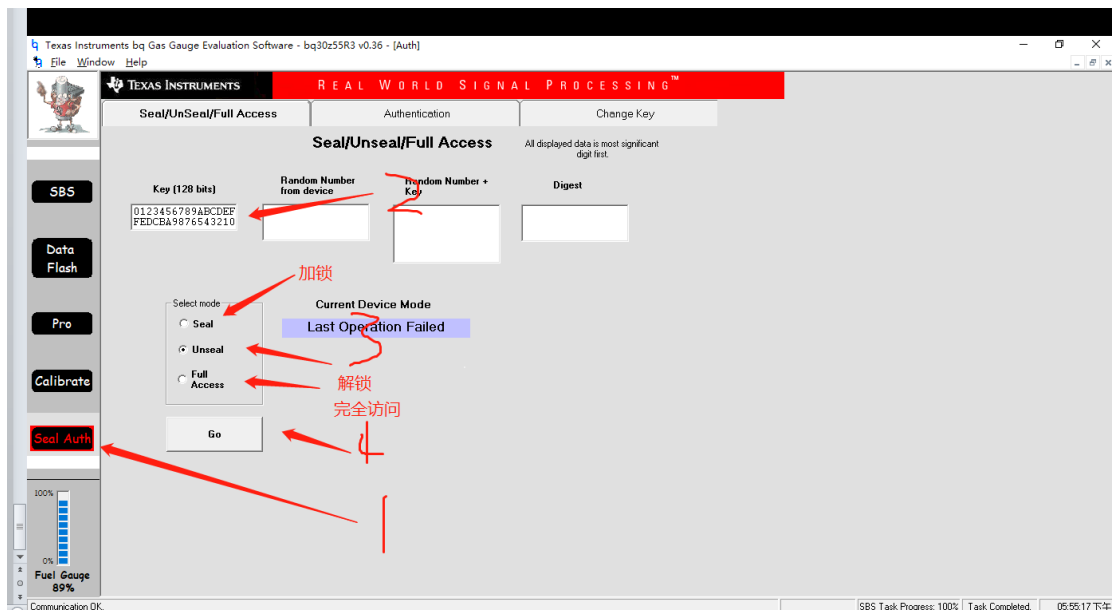


修改容量





最后一定不要忘记关闭电池完全访问，否则会不识别电池



Power		Advanced Ch	
Permanent Fail*		PF Ste	
Gas Gauging		Ra Tabl	
Name	Value	Unit	Na
Data	-	-	Ma
Remaining AH Cap. Alarm	440	mAh	De
Remaining WH Cap. Alarm	680	cWh	De
Remaining Time Alarm	10	min	FD
Initial Battery Mode	0081	-	Se
Design Voltage	15200	mV	Cle
Specification Information	0031	-	Se
Manufacture Date	26-Sep-2015	date	Cle
Serial Number	027F	-	FC
Cycle Count	1	-	Se
Cycle Count Percentage	75	%	Cle
Max Error Limit	100	%	Se
Design Capacity mAh	4480	mAh	Cle
Design Capacity cWh	6809	cWh	

Gas Gauging		
Name	Value	Unit
<b>State</b>	-	-
Qmax Cell 0	4700	mAh
Qmax Cell 1	4700	mAh
Qmax Cell 2	4700	mAh
Qmax Cell 3	4700	mAh
Qmax Pack	4700	mAh
Update Status	OE	-
Cell 0 Chg Voltage at EoC	4340	mV
Cell 1 Chg Voltage at EoC	4340	mV
Cell 2 Chg Voltage at EoC	4340	mV
Cell 3 Chg Voltage at EoC	4340	mV
Current at EoC	248	mA
Avg I Last Run	-4199	mA

Lifetimes		
SBS Configuration		
Name	Value	Unit
<b>TDA</b>	-	-
Set Voltage Threshold	3200	mV
Clear Voltage Threshold	3300	mV
Set % RSOC Threshold	10	%
Clear % RSOC Threshold	15	%
<b>TCA</b>	-	-
Set Voltage Threshold	4350	mV
Clear Voltage Threshold	4100	mV
Set % RSOC Threshold	100	%
Clear % RSOC Threshold	95	%
<b>Max Error</b>	-	-
Time Cycle Equivalent	24	h
Cycle Delta	0.05	%

SBS Configuration		
Name	Value	Unit
Term Voltage	11200	mV
Term Voltage Delta	400	mV
User Rate-mA	0	mA
User Rate-cW	0	cW
Reserve Cap-mAh	0	mAh
Reserve Cap-cWh	0	cWh
Remcap Smoothing Filter	250	-
Fast Scale Start SOC	10	%
<b>Current Thresholds</b>	-	-
Dsg Current Threshold	50	mA
Chg Current Threshold	50	mA
Quit Current	20	mA

Gas Gauging		
Power		Advanced (
Name	Value	Unit
<b>Voltage</b>		-
Cell Scale 0	20602	-
Cell Scale 1	20666	-
Cell Scale 2	20651	-
Cell Scale 3	20664	-
Pack Gain	51992	-
BAT Gain	49426	-
<b>Current</b>	-	-
CC Gain	6.245	-
Capacity Gain	1862545.5	-
<b>Current Offset</b>	-	-
CC Offset	-7232	-
Coulomb Counter Offset San	64	-
Board Offset	0	-
<b>Temperature</b>	-	-
Internal Temp Offset	0.0	degC
External1 Temp Offset	0.0	degC
External2 Temp Offset	-3.0	degC
<b>Internal Temp Model</b>	-	-
Int Coeff 1	0	-
Int Coeff 2	0	-
Int Coeff 3	-11136	-

#### a.精灵 4 数据

<p>解封密码</p> <p>0123456789ABCDEFEDCBA9876543210</p>
<p>芯片型号数据包 bq30z55r3 0.36</p>

## b.御 1 数据

改完参数要加密才能退出，否则无法验证电池

命令 29 是清除 pf 解锁

12 是设备重启

28 是寿命数据重置

2A 黑夹子重置

改好参数要输入 12 重启设备

Name	Value	Unit	Log	Scan
Manufacturer Access	0000	hex	✓	✓
Remaining Cap. Alarm	150	mAh	✓	✓
Remaining Time Alarm	10	min	✓	✓
Battery Mode	6001	hex	✓	✓
At Rate	0	mA	✓	✓
At Rate Time To Full	65535	min	✓	✓
At Rate Time To Empty	65535	min	✓	✓
At Rate OK	1	-	✓	✓

Name	Value	Unit	Log	Scan
Temperature	27.85	degC	✓	✓
Voltage	15314	mV	✓	✓
Current	-32	mA	✓	✓
Average Current	-32	mA	✓	✓
Max Error	1	%	✓	✓
Relative State of Charge	44	%	✓	✓
Absolute State of Charge	40	%	✓	✓
Remaining Capacity	1153	mAh	✓	✓

Name	Value	Unit	Log	Scan
Full charge Capacity	2640	mAh	✓	✓
Run time To Empty	2162	min	✓	✓
Average Time to Empty	2162	min	✓	✓
Average Time to Full	65535	min	✓	✓
Charging Current	0	mA	✓	✓
Charging Voltage	0	mV	✓	✓
Battery Status	4800	hex	✓	✓
Cycle Count	0	-	✓	✓

SBS

IT Status

Permanent Failure/Safety

Voltages	Value	Units	Log
Cell Voltage 1	3827	mV	✓
Cell Voltage 2	3835	mV	✓
Cell Voltage 3	3853	mV	✓
Cell Voltage 4	3798	mV	✓
Battery Voltage	15308	mV	✓
Pack Voltage	118	mV	✓

Bit 15

Log

✓

Gauging Status (Hex)

0812

LFP_FLX	TCA	TDA	DCVFR	LDMD	RY	QMAX	VDQ
NSFM	FC	FD	GEN	VOK	RJ	DSG	REST

Bit 0

Bit 15

Log

✓

Manufacturing Status

0058

CAL	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	FUSE
BBR	PF	LF	FET	GALGE	DSG	CHG	PCHG

Bit 0

Bit 23

Log

✓

Charging Status (Hex)

000208

RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	VCT
CCC	CVR	CCR	SJ	IN	HV	MV	LV
PV	DT	HT	STH	RT	STL	LT	UT

Bit 0

Temperature

Value

Units

Log

Internal Temp	20.0	degC	✓
TS1 Temp	-58.2	degC	✓
TS2 Temp	27.8	degC	✓
Cell Temp	27.8	degC	✓
FET Temp	-273.2	degC	✓

Version: 1.0.3  
bq30z55ExtSBS

Bit 31

Log

✓

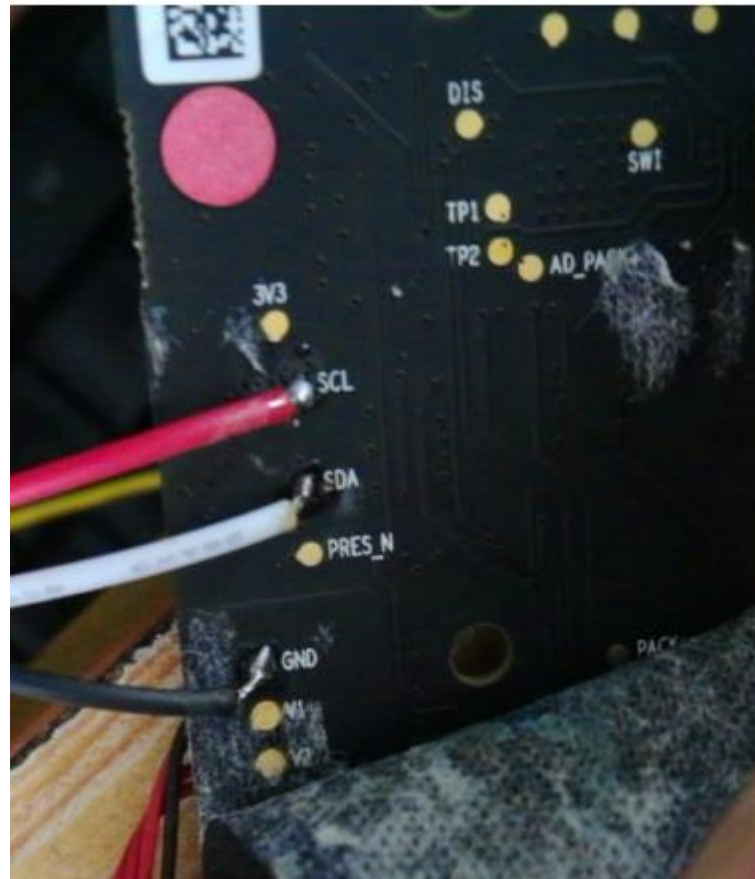
Operation Status (Hex)

00106200

Bit 16

RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
SLEEP	XCHG	XDSG	PF	SS	CAL	SEC1	SEC0	LED	CB	FUSE	GPOD	PCHG	CHG	DSG	PRES

Bit 0



Gas Gauging			Parameter			System Data		
Name	Value	Unit	Name	Value	Unit	Name	Value	Unit
<b>Data</b>	-	-	<b>Manufacturer Name</b>	ATL NVT	-	<b>Device Name</b>	DJ009+	-
Remaining AH Cap. Alarm	150	mAh	<b>Device Chemistry</b>	LION	-	<b>FD</b>	-	-
Remaining WH Cap. Alarm	228	cWh	Set Voltage Threshold	3000	mV	Clear Voltage Threshold	3100	mV
Remaining Time Alarm	10	min	Set % RSOC Threshold	0	%	Clear % RSOC Threshold	5	%
Initial Battery Mode	0081	-	<b>FC</b>	-	-	Set Voltage Threshold	4350	mV
Design Voltage	15200	mV	Clear Voltage Threshold	4100	mV	Set % RSOC Threshold	100	%
Specification Information	0031	-	Clear % RSOC Threshold	98	%	Clear Voltage Threshold	4100	mV
Manufacture Date	11-Dec-2018	date				Set % RSOC Threshold	100	%
Serial Number	006A	-				Clear % RSOC Threshold	98	%
Cycle Count	1	-						
Cycle Count Percentage	75	%						
Max Error Limit	100	%						
Design Capacity mAh	2935	mAh						
Design Capacity cWh	4461	cWh						

Gas Gauging		Ra Ta
Name	Value	Unit
<b>State</b>	-	-
Qmax Cell 0	2935	mAh
Qmax Cell 1	2935	mAh
Qmax Cell 2	2935	mAh
Qmax Cell 3	2935	mAh
Qmax Pack	2935	mAh
Update Status	OE	-
Cell 0 Chg Voltage at EoC	4330	mV
Cell 1 Chg Voltage at EoC	4330	mV
Cell 2 Chg Voltage at EoC	4330	mV
Cell 3 Chg Voltage at EoC	4330	mV
Current at EoC	181	mA
Avg I Last Run	-880	mA

### c. 御 Pro1 数据

御 pro 电池要充电或者开电池才能激活通讯，用 v0.36 就可以

Gas Gauging		Ra
Name	Value	Unit
<b>State</b>	-	-
Qmax Cell 0	1931	mAh
Qmax Cell 1	1931	mAh
Qmax Cell 2	1931	mAh
Qmax Cell 3	1915	mAh
Qmax Pack	1931	mAh
Update Status	OE	-
Cell 0 Chg Voltage at EoC	4330	mV
Cell 1 Chg Voltage at EoC	4330	mV
Cell 2 Chg Voltage at EoC	4330	mV
Cell 3 Chg Voltage at EoC	0	mV
Current at EoC	137	mA
Avg I Last Run	-628	mA

Name	Value	Unit
<b>Data</b>	-	-
Remaining AH Cap. Alarm	150	mAh
Remaining WH Cap. Alarm	228	cWh
Remaining Time Alarm	10	min
Initial Battery Mode	0081	-
Design Voltage	11400	mV
Specification Information	0031	-
Manufacture Date	30-Apr-2017	date
Serial Number	014F	-
Cycle Count	1	-
Cycle Count Percentage	75	%
Max Error Limit	100	%
Design Capacity mAh	1915	mAh
Design Capacity cWh	2183	cWh

Name	Value	Unit
Manufacturer Name	ATL NVT	-
Device Name	DJ008	-
Device Chemistry	LION	-
<b>FD</b>	-	-
Set Voltage Threshold	3000	mV
Clear Voltage Threshold	3100	mV
Set % RSOC Threshold	0	%
Clear % RSOC Threshold	5	%
<b>FC</b>	-	-
Set Voltage Threshold	4350	mV
Clear Voltage Threshold	4100	mV
Set % RSOC Threshold	100	%
Clear % RSOC Threshold	98	%



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## 四、结语

修改无人机电池有风险,此教程仅提供交流学习使用,请勿模仿,本人不承担任何相关责任。

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教程中如有错误, 请多包涵。