Connect EVM and EV2400 ,open BQSTUDIO, Click "UNSEAL"--- >"UNSEAL\_FULL\_ACCESS"
 --- >"ENTER\_CFG\_UPDATE" as following

| Board   | ~ <b>D</b>              | C Registers 23           |              |       |                       |         |       |                        |  |       |                   |                | • •                | 🗢 Commends 23          |
|---|-------------------------|--------------------------|--------------|-------|-----------------------|---------|-------|------------------------|--|-------|-------------------|----------------|--------------------|------------------------|
| fresh is ON - C                               | lick to Turn OFF        | Registers                |              |       |                       |         |       |                        |  |       |                   | Start Log S    | 🗇 😴<br>can Refresh | Commands               |
| Version: 1.3.101                              | 1                       | Registers                |              |       |                       |         |       |                        |  |       |                   |                |                    | ENTER_CRG_UPDATE       |
| _   |                         | Name                     | Value        | Units | Name                  | Value   | Units | Name                   | Value                                    | Units | Name              | Value          | Units              | EXIT_CFG_UPDATE_REINIT |
|   | EV2400                  | Votage                   | 4089         | mV    | Average Power         | -3      | cW    | Max Load Current       | -1000                                    | mA    | Charging Current  | 200            | mA                 | EXIT CFG UPDATE        |
| ~ 1   | 4 etrabalito .26        | Current                  | -8           | mA    | At Rate               | 0       | mA    | Max Load Time to Empty | 275                                      | min   | BTP Discharge Set | 150            | mAh                |                        |
|   |                         | Temperature              | 23.7         | degC  | At Rate Time To Empty | 65535   | min   | Raw Coulomb Count      | 3  | mAH   | BTP Charge Set    | 175            | mAh                | SEI_PROFILE_I          |
|   |                         | Relative State of Charge | 94           | %     | Average Time to Empty | 34395   | min   | internal Temperature   | 23.7                                     | degC  | EDV Threshold     | 3631           | Vm                 | SET PROFILE 2          |
|   |                         | Remaining Capacity       | 4586         | mAh   | Average Time to Full  | 65535   | min   | Cycle Count            | 0  |       | CEDV RemCap       | 4586           | Vm                 |                        |
|   | 12C                     | Full charge Capacity     | 4900         | mAh   | Standby Current       | -8      | mA    | State of Health        | 100                                      | %     | Smooth RemCap     | 4585           | mV                 | SET_PROFILE_3          |
|   |                         | Average Current          | -8           | mA    | Standby Time to Empty | 34395   | min   | Charging Voltage       | 4200                                     | Vm    | Smooth Current    | 0              | mA                 | SET_PROFILE_4          |
| <b>D</b> .                                    |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | SET_PROFILE_5          |
|   | bq27220                 |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | SET_PROFILE_6          |
|   | Addr: 0xAA<br>23.8 degC |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | BOARD_OFFSET           |
| <u>۲</u>                                      |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | CC_OFFSET              |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | CC_OFFSET_SAVE         |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | OCV_CMD                |
| 9 mV  |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | → BAT_INSERT           |
| 94%   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | ✓ BAT_REMOVE           |
|   |                         | Bit Registers            |              |       |                       |         |       |                        |  |       |                   | Bit High Bit L | ow RSVD            | SET_SNOOZE             |
| ALL DE LE |                         | Name                     | Value 0x0002 | Bit7  | Bit6                  | Bt5     | _     | Bit4 Bit               | 3  | 842   | Bit1              | Bit            | 0                  | CLEAR_SNOOZE           |
| 500   |                         | Control (Ingil)          | 00003        | Dev/D | newo                  | ROVD    |       | ROA ENO                | 76                                       | PATT  | PATT DI           | RATT           | 0                  |                        |
| 1000  |                         | Ballany Status (high)    | 0x5028       | FD    | OCVCOMP               | OCIVEAL |       | SI EED OT              | n la | OTT   | DZ DATI_DI        | CHO            | NH                 | ✓ SEAL                 |
| 1500  |                         | Battery Status (low)     | 0,0020       | RSVD  | TCA                   | OCVO    |       | AUTH GD BATTE          | RES                                      | TDA   | SYSDWN            | DSC            | 3                  | DEVICE_NUMBER          |
| 2000 3  |                         | Operation Status (high)  | 0x0024       | RSVD  | RSVD                  | RSVD    |       | RSVD RSV               | D  | CEGUP | ATE RSVD          | RSV            | D                  |                        |
| -8 ¥  |                         | Operation Status (low)   |              | BTPN  | T SMTH                | NITCOM  | P     | VDQ EDV                | 2  | SEC   | SEC0              | CALL           | /D                 | FW_VERSION             |
|   |                         | Gauging Status (high)    | 0x40         | VDQ   | EDV2                  | EDV1    |       | RSVD RSV               | 'D                                       | FCC:  | K RSVD            | RSV            | D                  | 🔮 FW_BUILD             |
|   |                         | Gauging Status (low)     |              | CF    | DSG                   | EDV     |       | RSVD TC                |  | TD    | FC                | FD             |                    | Log Panel              |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | - Transaction Log      |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    | Uniona Const. Down     |
|   |                         |                          |              |       |                       | Į       |       | Į                      |  |       |                   | Į              | 1.                 | URSEA [0x9672   N/A    |
|   |                         |                          |              |       |                       | [       |       |                        |  |       |                   |                |                    | USEAL L. OJEFF. MA     |
|   |                         |                          |              |       |                       |         |       | Į                      |  |       |                   |                |                    | ENTRE 063 XHA          |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    |                        |
|   |                         |                          |              |       |                       | [       |       |                        |  |       |                   | Į.             |                    |                        |
|   |                         |                          | (            |       |                       | (       | 1     | j                      |  |       | 1                 |                |                    |                        |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    |                        |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    |                        |
|   |                         |                          |              |       |                       |         |       |                        |  |       |                   |                |                    |                        |

2.Click "calibration" and calibration: cc offset, board offset, temperature as following

| Battery Management Studio ( bqStudio ) 1.3.1   | 01   | -1813<br>  |
|--|--|--|
| Registers 🗫 Data Memory 🔶 Co   | nmands 🔟 Calibration 🏄 Advanced Comm 🏢 Golden Image 📔 Weth 🌄 Deb Ough  |  |
| ✓ DechBoard ▽ □  | Register = Data Memory C Calibration 32  | Commands 22  |
| Auto Refresh is ON - Click to Turn OFF   | Calibration  | Commands   |
| Note:         Pagestime         The labeling         Control         Control | Callback Weige Answerd Cana       Image: The Callback | Commands Com |
|  |  |  |
|  | texas  | S INSTRUMENTS  |

## 3.calibration :current as following

| Battery Management       | Studio ( bgStudio ) 1.3.10 | 1   |  | _ # ×        |
|--------------------------|----------------------------|---|--|--------------|
| 🚫 Registers 🥽            | P Deta Memory 💈 Com        | mands 🔍 Calibration 🏄 Advanced Comm 🔟 Online Image 🗽 Webb. 📟 Debt Ough  |  |              |
| / DeshEcerd              | ~ - 8                      | 🕞 Rajden   🗢 Dah Menory 🛄 Calibation 😫 🚥  | 🗢 Commands 22                                | • •          |
| Auto Refresh is ON - Cli | ick to Turn OFF            | Calibration   | Commands                                     |              |
| bganotao version: 13.101 |                            | Perform Calibration   | ENTER_CR0_UPDATE                             | -            |
|                          |                            | Solori the type of calibration to perform and enter the attant input parameters.  | EXIT_CFO_UPDATE_REINIT                       | - 8          |
|                          | EV2400<br>Yemion.0.28      | CC Offset   | EXIT_CRO_UPDATE                              | - 8          |
| ~                        |                            | Cables CC Offst   | SET_PROFILE_1                                | - 8          |
|                          |                            | Board Offset  | SET_PROFILE_2                                | - 8          |
| <b>↓</b> ∎               | 12C                        | Calhade Board Offset  | <ul> <li>SET PROFILE 4</li> </ul>            | - 8          |
|                          |                            | Temperature   | <ul> <li>SET_PROFILE_5</li> </ul>            | - 8          |
| 22                       | bq27220<br>0220_0_03       | Orage Applet Tempenter 6 <sup>2</sup> Internal Temp<br>∫St Starto <sup>2</sup> B59 de <sub>4</sub> C ☐ Chilters C Biomal Temp | SET_PROFILE_6                                | - 8          |
| 4                        | Addr: UxAA<br>25.8 degC    |   | BOARD_OFFICET                                | - 8          |
| 0                        |                            | Current Orage Asplind Current   | CC_OFRET                                     | - 8          |
|                          |                            | -1455 m.A 1460 m.A. 🔁 Calibrate Current   | CC_OPHET_SAVE                                | - 8          |
| 4172 mV                  |                            | Voltage<br>Grage Applied Voltage  | BAT INSERT                                   | - 8          |
| 100%                     |                            | 1172 mV Callos Voluge   | BAT_REMOVE                                   | - 8          |
|                          |                            | Califordi Ost Ostage  | SET_SNOOZE                                   |              |
| AND DECK                 |                            |   | CLEAR_SNOOZE                                 |              |
| 1000 1000                |                            |   | ✓ SEAL                                       |              |
| -2000 2000               |                            |   | DEVICE_NUMBER                                |              |
| -1455                    |                            |   | FW_BUILD                                     |              |
|                          |                            |   | Log Pagel                                    | Clear Log    |
|                          |                            |   | Transction Log                               |              |
|                          |                            |   | Arter Jacob Republic                         |              |
|                          |                            |   |  | ê tî l       |
|                          |                            |   | Alth., [5882], 396 [8                        | <u>۽ ا</u>   |
|                          |                            |   | UNSEA 0x36777 1778. 19<br>UNSEA 0x3672 N/A N | 1/A          |
|                          |                            |   | USEAL t.: 0xFFFF N/A N<br>ENTER 0x90 N/A N   | 18.<br>16. • |
|                          |                            |   |  | 12           |
|                          |                            | 4 Texas Instruments   |  |              |

## 4.calibration:voltage as following

|  | File Yarw Window Help     | inarao ( agarini ao y 120/10         | 3<br>   |   | - 2 -     |
|--|---------------------------|--------------------------------------|---|---|-----------|
| Image: mean low mode         Counts ::         Image: mean low mode         Image: me  | 🚫 Registers 🤝             | Data Memory 💈 Com                    | anada 🔍 Calibration 🎬 Advaced Comm 🛄 Oxides Image 🚂 With 🖾 Data Oraph           |   |           |
| <ul> <li>Provide the set of the set of</li></ul> | JeahBoard                 | ~ ~ 8                                | 🕞 Registra 🗢 Dah Menory 🗖 Calibration 22  | 😴 Commands 22   | • •       |
| <pre>phote has 1.10</pre>  | Auto Refresh is ON - Clic | k to Turn OFF                        | Calibration   | Commands  |           |
| Visco       Visco         Visco       Contraction         Contraction       Contraction <tr< td=""><td>bqStudio Version: 1.3.101</td><td></td><td>Perform Galibration</td><td>ENTER_CR3_UPDATE</td><td>-</td></tr<>  | bqStudio Version: 1.3.101 |                                      | Perform Galibration   | ENTER_CR3_UPDATE  | -         |
| Vinadia  |                           |                                      | Select the type of cubbration to perform and eater the actual input parameters. | EXIT_CF0_UPDATE_REINIT  | - 1       |
| Image: Constant                                      |                           | EV2400<br>Vernion.0.28               | CC Offset   | EXIT_CR0_UPDATE   | - 1       |
|  | ~                         |                                      | C calinal CC Offiet   | SEI_PROFILE_1   | - 1       |
| Image: Comparison of the posterior of the                                      |                           |                                      | - Board Offset  | SET_PROFILE_2   | - 1       |
| Windowski       Image: Construction of Constructio of Construction of  |                           | 12C                                  | Calibra Eout Offst  | SET_PROFILE_3   | - 1       |
| Normality       Normality       Normality       Normality  | ~                         |                                      | - Temperature   | SET_PROFILE_4   | - 1       |
| Weight       Weight       Weight       Chanke Responde       C Bankel Responde       C Ba  | Salar Salar               | bg27220                              | Orage Appled Franjerstuse & Internal Temp                                       | SEL PROFILE 6   | - 1       |
|  | Up J                      | 0220_0_03<br>Addr: 0xAA<br>26.6 desC | S 5 degC [259] degC C Caldrein Temperature C External Temp                      | BOARD_OFFICET   | - 1       |
| Wing       Applet Vings         Wing       Applet Vings         Wing       Applet Vings         Wing       Applet Vings         Wings       Applet Vings         Wings       Colume Guade  |                           |                                      | Current   | CC_OFFICET  | - 1       |
|  | 600                       |                                      | 0 mage Applet Connet<br>0 mag - 1460 mag L Calibrate Connet                     | CC_OFFSEI_SAVE  | - 1       |
| 00000 <sup>m</sup> Applet 7 Jugg         0000 <sup>m</sup> 000 <sup>m</sup> 0000 <sup>m</sup>   |                           |                                      | Voltage   | OCATCWD   | - 1       |
|  | 4200 mV                   |                                      | Grap Applet Value<br>Trouge i Grap and College and College Applet Value         | BAT_INSERT  | - 1       |
|  | 100 %                     |                                      | Pan mi Pan mi Camerougi   |   | - 1       |
|  |                           |                                      | Calitosi Oso Osoga  | <ul> <li>SET_SNOOZE</li> <li>CURAD (MICONT)</li> </ul>  |           |
|  | 500 500                   |                                      |   | CLEAK_SNOULE  |           |
|  | 1000 1000                 |                                      |   | DEVICE_NUMBER   |           |
|  | 2000 2000                 |                                      |   | FW_VERSION  |           |
|  |                           |                                      |   | 🛷 FW_BUILD  |           |
|  |                           |                                      |   | Log Pasel   | Clear Log |
|  |                           |                                      |   | Transition Log<br>Henry Lond Reput<br>Different Sold Sold No.<br>2015 State Harving, Bask Sol |           |
| IDEEL 0.0072         NA         BA           BITES_000         NA         BA           UNITS         IDEEL 0.0072         NA   |                           |                                      |   | Anna Sallarita ang ang ang ang ang ang ang ang ang an   |           |
|  |                           |                                      |   | UNSEA 0x3672 N/A N/A<br>USEAL t 0x5FFF N/A N/A  | A<br>X    |
| toxs Instruments   |                           |                                      |   | ENTER 0x90 N/A N/A  | A - 2     |
|  |                           |                                      | 👆 Texas Instruments   | JL. (****   |           |

5. Change full charge capacity 3000 to 4900, design capacity 3000 to 4900, design capacity 3700 to 4200; as following.



## 6. charge battery ID to 4 as following

| · · · · · · · · · · · · · · · · · · ·  |                                 |                               |                        |   |                        |
|--|---------------------------------|-------------------------------|------------------------|---|------------------------|
| baad   | 🖻 🗖 🛞 Registers 🥗 Data Memory 3 | Calibration                   |                        |   | Command: 🛛             |
| resh is ON - Click to Turn OFF   | Data Memory                     |                               | FilterBearch<br>Auto E | ixport Export Import Write_All Reed All   | Commands               |
| fermon: 1.3.101  | Read/Write Data Memory Contents |                               |                        |   | ENTER_CFG_UPDATE       |
| Λ  | Calibration                     | Name                          | Value                  | Unit  | EXIT CFG UPDATE REINIT |
| C DIDION   |                                 | Charge Termination            |                        |   |                        |
| Version.0.28   | Configuration                   | Taper Current                 | 100                    | mA  | EXIT_CFG_UPDATE        |
|  | Gas Gaucino                     | - Safety                      | <b>55</b> A            | 10  | SET PROFILE 1          |
| ·  | Cas casiging                    | OT Che Time                   | 55.0                   |   |                        |
|  | Calibration (Present OTP)       | OT the Becauser               | 50.0                   | 10  | SEI_PROFILE_2          |
|  |                                 | OT Dag                        | 60.0                   | 2.  | . CET BROENE 2         |
| 12C  | Configuration (Present OTP)     | OT Deg Time                   | 2                      |   | SEI_PROFILE_3          |
|  | Gas Gauging (Present OTP)       | OT Dag Recovery               | 55.0                   | 10  | SEI PROFILE 4          |
|  | cost cooping (recount orry)     | E Registers                   |                        | ě do se d |                        |
| n.   | Calibration (ROM Default)       | Operation Config A            | 0484                   | hex   | SET_PROFILE_5          |
| bg27220  |                                 | Operation Config B            | 1000                   | bex   | - OPT BOOTH P.C.       |
| 0220_0_03  | Configuration (ROM Default)     | SOC Deta                      | 1                      | 5   | SEI_FROFILE_6          |
| Addr: UxAA<br>23.5 dagC  | Gas Gaucino (ROM Default)       | Cik Cti Reg                   | 09                     | hex   | BOARD OFFSET           |
| NO   | Cost case ing (rice a contact)  | Device Type                   | 0220                   | Hex   |                        |
| J 🛂  |                                 | E BTP                         |                        |   | CC_OFFSET              |
|  |                                 | IO Config                     | 00                     | hex   | T CO OFFICE ALUE       |
|  |                                 | Init Discharge Set            | 150                    | mAh   | ✓ CC_OPPSEI_SAVE       |
|  |                                 | Init Charge Set               | 175                    | mAh   | OCV CMD                |
|  |                                 | Power                         |                        |   |                        |
| 8 mV   |                                 | Sleep Current                 | 10                     | mA  | BAT_INSERT             |
| 4%   |                                 | Bus Low Time                  | 5                      | 5   | - DIE DRIGHT           |
|  |                                 | Offset Cal Inhibit Temp Low   | 5.0                    | 'C  | BAI_REMOVE             |
|  |                                 | Offset Cal Inhibit Temp High  | 45.0                   | °C  | SET_SNOOZE             |
|  |                                 | Sleep Voltage Time            | 20                     | 8   |                        |
| A CONTRACTOR OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER |                                 | Sleep Current Time            | 20                     | 5   | CLEAR_SNOOZE           |
| 500  |                                 | Current Thresholds            |                        |   |                        |
| 1000   |                                 | Discharge Detection Threshold | 60                     | mA  | SHAL                   |
| 1500   |                                 | Charge Detection Threshold    | 75                     | mA  | C DEVICE NUMBER        |
| 2000 -2  |                                 | Ouit Current                  | 40                     | mA  | , DUTTOD_ITOTIDUIT     |
|  |                                 | Discharge Relax Time          | 60                     | 5   | FW_VERSION             |
| -8   |                                 | Charge Relax Time             | 60                     | 5   |                        |
|  |                                 | Quit Relax Time               | 1                      | 5   | A FM_BOILD             |
|  |                                 | E Data                        |                        |   | Log Panal              |
|  |                                 | Initial Standby               | -10                    | mA  | Log raties             |
|  |                                 | Discharge                     |                        |   | Transaction Log        |
|  |                                 | SysDown Set Volt Threshold    | 0150                   | Vm  | Name Cmd Result Re-    |
|  |                                 | SysDown Set Volt Time         | 2                      | 5   | UNSEA 0x3672 N/A N/#   |
|  |                                 | SysDown Clear Volt Threshold  | 3250                   | Vm  | USEAL t 0xFFFF N/A N/# |
|  |                                 | E SOC                         |                        |   | ENTER 0x90 N/A N/#     |
|  |                                 | Flag Config A                 | 0c8c                   | hex   |                        |
|  |                                 | Flag Config B                 | 8c                     | hex   |                        |
|  |                                 | CEDV Profile Select           |                        |   |                        |
|  |                                 | Battery ID                    | 04                     | nex   |                        |
|  |                                 | E OTP                         |                        |   |                        |
|  |                                 | Token                         | 166                    | · -   |                        |
|  |                                 | al                            |                        |   |                        |

## 7.Create image file \*.ot.fs file

| Battery Managemen        | t Studio ( bqStudio ) 1.3.10 |  |   | _6×          |
|--------------------------|------------------------------|--|---|--------------|
| Registers                | 🗩 Data Memory 🛛 🍰 Com        | aads 🔟 Galdentien 🏄 Advanced Comm 🎬 Golden Image 📔 Wath 🔚 Data Graph 🛄 Errors  |   |              |
| JoshBoard                | ~                            | Begisten > Dels Memory (1) Celènsion (2) Colensinante 12   | Commands 22                                 | • •          |
| Auto Refresh is ON - 0   | Click to Turn OFF            | Golden Image   | Commands                                    |              |
| bgStudio Version: 1.3.10 | 1                            | Goldea Image Export  | ENTER CEG HPDATE                            | 1            |
| n                        |                              | This place is will allow you to export image file.<br>It will not the data hyperprovident of the connected means and now it to sum built drive in various formats. | · EVIT CR3 UPDATE REINIT                    | - 11         |
|                          | EV2400                       | Cutput Location  | · EVIT CER HEDATE                           | - 11         |
|                          | Version.0.28                 | Output Diarstory C:WDstreyMeasgessenEtholic/OutputFiles Beevee   | SET PROFILE 1                               | - 11         |
| ~                        |                              | Base Fale Name 0220_0_03-bg27220 Open Directory  | • CET BROFILE 2                             | - 11         |
|                          |                              | C Output Formats   | - SEI_FROFILE_2                             | - 11         |
| ↓1                       | 12C                          | FØ         OMRS Fåle (da)         0220_0_0.0-3-027220 gm fs         Options  | SEI_FROFILE_S                               | - 11         |
| -                        |                              | F0 OTRs Fale (fd)         0220.0.03-bc27220.01fs         Options   | SET_PROFILE_4                               |              |
|                          | hn27220                      | Creste Image Film  | SET_PROFILE_5                               | - 11         |
|                          | 0220_0_03<br>Addr: 0xAA      |  | SET_PROFILE_6                               | - 11         |
| - Yr                     | 23.7 degC                    |  | BOARD_OFFSET                                |              |
|                          |                              |  | CC_OFFNET                                   |              |
|                          |                              |  | CC_OFFSET_SAVE                              |              |
|                          |                              |  | OCV_CMD                                     |              |
| 4088 mV                  |                              |  |   |              |
|                          |                              |  | BAT_REMOVE                                  |              |
|                          |                              |  | SET_SNOOZE                                  |              |
| ATT OTHER                |                              |  | CLEAR_SNOOZE                                |              |
| -1000 1000               | à                            |  | / SEAL                                      | - 11         |
| -1500 1500-              | 7                            |  | CEVICE_NUMBER                               |              |
| -8                       |                              |  | 🔮 FW_VERSION                                | - 8          |
|                          |                              |  | 🤣 FW_BUILD                                  | *            |
|                          |                              |  | Log Panel                                   | Clear Log    |
|                          |                              |  | Transaction Log                             |              |
|                          |                              |  | SEE   | 8/2          |
|                          |                              |  | BEEAL L., OMPRE., MA. B<br>EFTER ONCO MA. Y | 1/2.<br>5/2. |
|                          |                              |  | BRSBA., DeCOTA., MAR N                      | 12           |
|                          |                              |  | BEDGE C., WENT, MAL 8                       | 404          |
| 1                        |                              |  |   |              |
|                          |                              |  |   |              |
|                          |                              |  |   |              |
|                          |                              | 🌵 TEAS INSTRUME  | rs  |              |

8. program OTP successfully

9. Connect EVM and EV2400 ,open BQSTUDIO, now the design capacity and voltage are correct,but the charge current and discharge current are incorrect. Can you help me? Which step wrong and How to solve it? Thanks!