BMS Software for LFP48100-Integrated LiFePO<sub>4</sub> Battery

# **OPERATION MANUAL**

Version 2.2

## Content

| 1. Foreword   | 3  |
|---|----|
| 2. Preparation before Operation                     | 4  |
| 3. Operation Illustration for Individual Battery    | 5  |
| 3.1 Connection Method                               | 5  |
| 3.2 Software Display Interface                      | 5  |
| 3.2.1 Realtime Monitoring                           | б  |
| 3.2.2 Multi Monitoring                              | 7  |
| 3.2.3 Parameter Setting                             | 8  |
| 3.2.4 System Configuration                          | 8  |
| 3.2.5Change Language                                | 10 |
| 4. Operation Illustration for Batteries in parallel | 10 |
| 4.1 Connection Method                               | 10 |
| 4.2 BMS Software Display Interface                  | 12 |
| 5 Application of "ChgCurrentLimit" Button           | 15 |
| Annex1 RS232 Communication                          | 15 |
| Annex2 RS485 Communication                          | 15 |
| Annex3 Band Switch Address Code                     | 16 |

## 1. Foreword

The operation manual is only suitable to integrated LiFePO<sub>4</sub> battery system for telecommunications supplied by SHENZHEN NEATA POWER TECH CO.,LTD

Integrated LiFePO<sub>4</sub> battery system consists mainly of Cells and BMS (Battery Management System). BMS consists of five subsystems: charge and discharge management; heat management; communications management; data management; equalization management. For better maintaining battery or data acquisition, it is very useful to operate the BMS software. It can display real time information and find directly the reason that batteries have faults.

Note:

- Setting battery parameters should be operated or supervised by engineers who are experienced.
- Don't revise battery parameters by the BMS software when a battery is running.
- The adverse consequences caused by incorrect operation (including revising battery parameters) shall be borne by the operator.
- Don't take it to the other norms battery for its incompatible.

## **Operation Manual for BMS (VIDEO):**



## 2. Preparation before Operation

The articles in table 2-1 below should be prepared well.

| No. | articles  | Pictures  | Remark                                    |
|-----|---|---|---|
| 1   | One computer with USB<br>& interface,<br>Windows7/8/10(or<br>Windows XP) and 11             |   | Provide for<br>oneself                    |
| 2   | One<br>RS232communication<br>line; One USB to<br>RS232transducer(Need to<br>install driver) |   | Provided<br>by<br>Neata (if<br>necessary) |
| 3   | "BMSToos-HS2.0.7"<br>folder on the computer<br>(RS232communication<br>software)             | 名称<br>Config<br>BmsTools<br>BmsTools.exe.config | Provided<br>by Neata                      |
| 4   | Integrated LiFePO₄<br>battery   |   | Provided<br>by Neata                      |

| Table | 2-1 | the | necessary | / articles  |
|-------|-----|-----|-----------|-------------|
| TUDIC | ~ - | the | necessar  | , ai ticico |

## You can download BMSTools-HS2.0.7 software:



## **3.** Operation Illustration for Individual Battery

## **3.1 Connection Method**

The connection method is shown in table 3-1 below.

| Table 3-1 Connection method for Divis soltware | Table 3-1 | Connection | method for | BMS software |
|--|-----------|------------|------------|--------------|
|--|-----------|------------|------------|--------------|

| No. | articles  | Pictures   | Remark                                 |
|-----|---|--|--|
| 1   | One RS232 communication<br>line; One USB to<br>RS232transducer  | Connect the interface ① to the interface ③, the interface ② to USB interface of computer, the interface ④ to RS232 interface of the battery. | Provided by<br>Neata (if<br>necessary) |
| 2   | Press the "Reset" button<br>about 6 seconds till all lamps<br>light up after loosening and<br>heard drip  |  |  |
| 3   | Open "BMSToos-HS2.0.7"<br>folder and click the<br>"BMSToos" file on the<br>computer. Wait for some<br>seconds until the<br>communication successfully<br>connected. | 名称<br>Config<br>参 BmsTools<br>BmsTools.exe.config  | Provided by<br>Neata                   |

#### **3.2 Software Display Interface**

The software shows six display interfaces. They are realtime monitoring, multi monitoring, memory information, parameter setting, system configuration, change language, which can be switched by clicking them.

#### 3.2.1 Realtime Monitoring

| 💠 Bms         | sTools H                      | S2.0.3                             |               |               |                             |               |                 |                         |                               |                        |          |      |        |                           | – 🗆 X   |
|---------------|-------------------------------|------------------------------------|---------------|---------------|-----------------------------|---------------|-----------------|-------------------------|-------------------------------|------------------------|----------|------|--------|---------------------------|---|
| Realt         | ime Mor                       | nitorir                            | ug Mui        | lti M         | onitor                      | ing ]         | (emory          | Info.                   | Para                          | meter S                | etting   | Syst | em Con | fig.                      | Export Data Protocols   |
| 0 11 22       | 1<br>12<br>23                 | 2<br>13<br>24                      | 3<br>14<br>25 | 4<br>15<br>26 | 5<br>16<br>27               | 6<br>17<br>28 | 7<br>18<br>29   | 8<br>19<br>30           | 9<br>20<br>31                 | 10<br>21<br>32         |          |      |        | <b>Seria</b><br>Ser<br>Pa | I Port<br>rial Port Baud Rate 9600 V Open<br>COM Tyep RS232 V Monitoring<br>ack_Start 1 V Pack_End 1 V LoopDisplay<br>ADDR Interval 1 V S |
| Pack          | Pack V<br>Pack V<br>Pack (    | <b>ation</b><br>Voltage<br>Current |               |               | V                           | ^             | Ten             | nperat                  | ure(°C)                       | MC                     | 5_T      |      | ^      |                           | Protocol  |
| F             | RemainCa                      | SOC<br>SOH<br>apacity              |               |               | %<br>%<br>mAH               | 1             | Tc<br>Tc        | ell 1<br>ell 3<br>ell 5 |                               | Tcel<br>Tcel           | L 4      |      |        | Syste<br>CHA<br>OLIS      | em Status<br>ARGING-OFF @CHARGING @CHG-LIMIT-OFF @ACin<br>SCHARGING-OFF @DISCHARGING @HEATER-OFF @Fully                                   |
| Ind           | FullCa<br>Battery<br>lependen | apacity<br>Cycle<br>t Volt         |               |               | nAH<br>nV                   |               | Tc<br>Tc<br>Tce | ell 7<br>ell 9<br>11 11 |                               | Tcel<br>Tcell<br>Tcell | 10<br>12 |      |        | Alarr                     | n Status  |
| Ind<br>Cell V | lependen<br><b>(oltage</b> (  | t Curr<br><b>mV)</b>               |               |               | mA                          | ¥             | Tce             | 11 13                   |                               | Tcell                  | 14       |      | ~      | Prote                     | ect Status  |
|               | MaxVe<br>Vcell                | olt<br>1                           |               |               | Vcell :                     | 1inVolt<br>2  | : <u> </u>      | <br>[<br>]              | <br>/cell 3                   | VoltDi                 | f        |      | ^      | Fault                     | : Status  |
|               | Vcell<br>Vcell 1<br>Vcell 1   | 7                                  |               | V<br>V        | Vcell (<br>cell 1<br>cell 1 | B<br>1<br>4   |                 | N<br>Vo<br>Vo           | /cell 9<br>cell 12<br>cell 15 |                        |          |      |        | Swite                     | CHG Circuit II Sound Alarn II<br>DSG Circuit II LED Alarn II  |
| VER:          | Vcell 1                       | .6                                 |               |               | B                           | MS S/I        | N:<br>N:        |                         |                               |                        |          |      | ✓      | sword                     | d Change 😹 🔀 18:50:24<br>2023-11-10   |

Fig. 3-1 Realtime monitoring display interface

The areas of "Realtime Monitoring" display interface in fig. 3-1 are illustrated as follow:

"Pack Information" area: this area shows real-time information including the pack voltage, current, SOC (State of Charge), SOH (State of Health), remain-capacity, full-capacity and charge-discharge cycle.

"Temperature" area: this area displays real-time temperature of the MOSFET, environment and four cells in real time.

"Cell Voltage" area shows the real-time voltage of every cell. The maximum and minimum cell voltages are marked by yellow and green separately.

"Serial Port" area shows pack No, port, pack quantity and address, etc.

"System Status" area: This area displays system status in real time.

#### Note: "CHG" = "Charge", "DSG" = "Discharge"

"Alarm Status" area: The area displays alarm status in real time.

"Protect Status" Area: the area displays protection status in real time. For example, over-charge voltage protection, under-discharge voltage protection, discharge over-temperature protection and discharge under-temperature protection, etc.

"Fault Status" Area: If the battery has a fault, there is a red light in "Fault Status" area.

"switch control" Area: This is switch control area. When batteries are used in parallel, "CHG Limiter" button plays a very important role in the area.

"Administrator Password" Area: These display interfaces are under read mode when the password is not right in the frame. Meanwhile, you can watch the state information of the battery, but can't revise the parameter. "Change" Area: "Change" button is used to reset the password.

Note: "Chg" = "Charge", "Dsg" = "Discharge", "OTP" = "Over-Temperature Protection", "OVP" = "Over-Voltage Protection".

#### 3.2.2 Multi Monitoring

🗌 Record data

Version: P15S100A-9469-1.10

Export

BES SH: 9469109320184Z

| DateTime            | Address | Pack Current(A) | Pack Voltage(V) | RemainCapacity(AH) | FullCapacity(AB |
|---------------------|---------|-----------------|-----------------|--------------------|-----------------|
| 2019-08-28 16:02:08 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:09 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:10 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:11 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:12 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:13 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:14 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:15 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:16 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 019-08-28 16:02:17  | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
| 2019-08-28 16:02:18 | 1       | 0.00            | 49.430          | 55.210             | 100.800         |
|                     |         |                 |                 |                    |                 |
|                     |         |                 |                 |                    |                 |
|                     |         |                 |                 |                    |                 |
|                     |         |                 |                 |                    |                 |
|                     |         |                 |                 |                    |                 |
|                     |         |                 |                 |                    |                 |
|                     |         |                 |                 |                    |                 |

Fig. 3-2 Multi monitoring display interface

Two areas of "Multi monitoring" display interface are illustrated as follow:

Pack SM: EED-AFSD-19071021-24

(2)

Area①: Recording the real-time status (time, pack No, current, voltage, remain-capacity, etc) of individual battery.

State:

System Time: 2019-08-28 16:02:29

Area<sup>(2)</sup>: Clicking "Display" frame, then " $\sqrt{}$ " is shown in the frame. Meanwhile, the interface can display the real-time status in Area<sup>(1)</sup>.

Clicking "Clear" button can clear the real-time record in Area<sup>①</sup>.

Clicking "Save" button can save the real-time record in Area<sup>①</sup>.

Clicking "Auto Storage" frame can store automatically the real-time record in Area1.

#### 3.2.3 Parameter Setting

Fig. 3-4 Parameter setting display interface

| altime Monitoring  | Data Save Me   | emory Information Param   | eter Setting   | System Configuration  | Export Datas  | Change Language   |  |
|--|--|---|--|---|---|---|--|
| Cell OV Alarm(V)<br>Cell OV Frotect(V)<br>Cell OVF Release(V)<br>Cell OVF Delay Time(mS)<br>CHG OC Alarm(A)<br>CHG OC Protect(A)<br>CHG OCP Delay Time(mS) | 3.60       ~         3.70       ~         3.38       ~         1000       ~         105       ~         1000       ~ | Pack OV Alarm(V)<br>Pack OV Protect(V)<br>Pack OVF Release(V)<br>Pack OVP Delay Time(mS)<br>CHG OT Alarm(°C)<br>CHG OT Protect(°C)<br>CHG OTP Release(°C) | 54.00       ~         55.50       ~         50.20       ~         1000       ~         50       ~         55       ~         55       ~         55       ~         50       ~         50       ~         50       ~         50       ~ | Cell UV Alarm(V)<br>Cell UV Frotect(V)<br>Cell UVF Release(V)<br>Cell UVF Delay Time(mS)<br>CHG VT Alarm( <sup>°</sup> C)<br>CHG VT Frotect( <sup>°</sup> C)<br>CHG UT Protect( <sup>°</sup> C) | 2.80<br>2.75<br>2.90<br>1000<br>-5<br>0<br>-5<br>-<br>0<br>-5<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>-<br>- | Pack UV Alarm(V)<br>Fack UV Frotect(V)<br>Fack UVP Release(V)<br>Fack UVP Delay Time(mS)<br>MOS OT Alarm(°C)<br>MOS OT Frotect(°C)<br>MOS OTF Release(°C) | 43.00     ~       41.25     ~       45.00     ~       1000     ~       90     ~       110     ~       85     ~ |
| CHG OC 2 Protect(A)<br>CHG OCP 2 Delay Time(mS)<br>USG OC Alarm(A)   | 150 v<br>100 v   | DSG OT Alarm('C)<br>DSG OT Protect('C)<br>DSG OTP Release('C)   | 55 ~<br>60 ~<br>55 ~   | DSG UT Alarm('C)<br>DSG UT Protect('C)<br>DSG UTP Release('C)   | -15     ∨       -20     ∨       -15     ∨   | ENV UT Alarm('C)<br>ENV UT Protect('C)<br>ENV UTP Release('C)   | -20 ~<br>-25 ~   |
| DSG OC 1 Protect(A)<br>DSG OCP 1 Delay Time(mS)<br>DSG OC 2 Protect(A)   | 105 V<br>1000 V<br>130 V   | Balance Threshold(V)<br>Balance AVcell(mV)<br>Sleep Vcell(V)  | 3.45 v<br>30 v<br>3.10 v   | Pack FullCharge<br>Voltage(V)<br>Pack FullCharge<br>Current(mA)<br>SOC Low Alarm(%)   | 52.50 v<br>1000 v<br>10 v   | ENV OT Alarm('C)<br>ENV OT Protect('C)<br>ENV OTP Release('C)   | 65 ~<br>70 ~<br>65 ~   |
| Contr ADR 1  | 500 V  | ead All   | 5 v  |   | Impor   | t Expor   | t  |

Note: Don't revise these parameters in the Fig. 3-4 above. Or the battery may have a fault when running.

## 3.2.5 System Configuration

Fig. 3-5 System configuration display interface

| y Information Parameter Setting System Configuration Export Datas Change Language Contr ADR 1 ~ |
|---|
| Tanufacture Information   |
| Pack SN EED-AFSD-19071021-24 Vrite Read   |
|   |
|   |
|   |
|   |
|   |

## 3.2.6 Export Datas

| PmodbusToos V2.2(LOG)            |                                  |                         |                |                 |                     |
|----------------------------------|----------------------------------|-------------------------|----------------|-----------------|---------------------|
| Realtime Monitoring Data Save Me | mory Information Parameter Sett: | ng System Configuration | Export Datas ( | Change Language |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  | £1                               | l tables                |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  | Γ                                | Export                  |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
|                                  |                                  |                         |                |                 |                     |
| Version: BMS SN:                 | Pack SN:                         | State:                  |                | System Time:    | 2019-09-06 18:58:33 |

## 3.2.7 Change Language



| 🜩 PbmsTools V1.02   |                              |  |                       |                |   | X                             |
|---|------------------------------|--|-----------------------|----------------|---|-------------------------------|
| Realtime Monitoring Mul                                   | ti Monitoring Me             | mory Information                       | Parameter Setting     | System Configu | ration Change Language                        |                               |
| Vr<br>Pack Volta  | ef                           | Calibration<br>Calibration             |                       | Сара           | Clty(MAH)<br>DesignCapacity<br>RemainCapacity | Read                          |
| -Current (mA)<br>CHG Curr (<br>(1000-60000<br>Zero Curr   | Change Language              | <br>                                   | Rest Tag              | 8              | FullCapacity<br>SG Cycle Setting              | Write                         |
| DSG Curr<br>(1000-6000)<br>-Cell Number Settin<br>Cell Nu | System Langt<br>Us<br>Change | ing: English<br>·To: 中文(简体)<br>English |                       |                | HG-DSG Cycle 0                                | Setting                       |
| - <b>CHG Current Settin</b><br>CHG Limit Cur              |                              | OK                                     | Cancel                |                |   |                               |
| -Gap Charge Setting<br>Gap Charge Thresho                 | ld                           | Setting                                |                       |                |   |                               |
| Version: P16S50A-5417L-1.10                               | S/N BarCode: 4850            | -2701-201701288   <b>CO</b>            | MM State: USB Connect | ed State:      | Stop Monitor Sys                              | tem Time: 2017-12-04 17:40:45 |

## 4. Operation Illustration for Batteries in parallel

### 4.1 Connection Method

The connection method is shown in table4-1 below.

| Table 4-1 Connection method for BMS software |
|--|
|--|

| No. | articles  | Pictures  | Remark  |
|-----|---|---|---|
| 1   | Connect RS485<br>communication line<br>between batteries        |   | RS485<br>communication<br>line provided<br>by Neata |
| 2   | One RS232 communication<br>line; One USB to RS232<br>transducer | Connect port ① to port ③, port ② to USB port of computer, port ④ to RS232port of the battery. | Provided by<br>Neata (if<br>necessary )             |

| 3 | Set Band Switch Address<br>Code.  | Image: Second condition         Image: Second condition <th image:="" second<="" th=""><th>Refer to<br/>"Annex3 Band<br/>Switch Address<br/>Code"</th></th> | <th>Refer to<br/>"Annex3 Band<br/>Switch Address<br/>Code"</th>                                       | Refer to<br>"Annex3 Band<br>Switch Address<br>Code" |
|---|---|---|---|---|
| 4 | Press the "Reset" button<br>about 3 seconds till all<br>lamps light up after<br>loosening and heard drip  |   |   |   |
| 5 | Open "BMSToos-HS2.0.7"<br>folder and click the<br>"BMSToos" file on the<br>computer. Wait for some<br>seconds until the<br>communication<br>successfully connected. | 名称<br>Config<br>� BmsTools<br>BmsTools.exe.config   | Provided by<br>Neata  |   |
| 6 | BMS Software display interfaces are shown.  | Production 12:20:00           Basilise Honitoring Data Save Heavy Information Parameter Setting System Configuration Emport Data Change Language<br>Save Save Save Save Save Save Save Save   | 2<br>2019 Easter<br>27<br>2019 Easter<br>2019<br>2019<br>2019<br>2019<br>2019<br>2019<br>2019<br>2019 |   |

#### 4.2 BMS Software Display Interface

For finding the real time information of Master Pack and each Slave Pack, it is feasible to set the buttons in the area of Serial Port in "Realtime monitoring" display interface. The details are shown below.



Step1: Click "Stop Monitor" frame.

Step2: Click "Pack" frame and choose the option "FF".

| Serial Port  |                  |                           |
|--------------|------------------|---------------------------|
| Port         | COM1 🔹           | Baud Rate 9600 - Open     |
| PollingCount | 1                | Contr ADR 1 Start Monitor |
|              | 2<br>3           | ing                       |
| -System Stat | د <mark>4</mark> |                           |
| ●CHARGE-OFF  | 6 t              | G CHG-LIMIT-OFF           |
| ●DISCHARGE-C | F 8 F<br>9       | GING CHEATER-OFF          |
| Alarm Statu  | 10               |                           |
|              | 12               | A                         |
|              | 13<br>14         |                           |
|              | 15               |                           |

Step3: Click "Start Monitor" frame, and the software shows the real time information of Master Pack. We can click "1,2,3…" to show the real time information of Master Pack or each Slave Pack

| Seria | al Port |    |             |      |   |               |
|-------|---------|----|-------------|------|---|---------------|
| Port  | COM3    | Ŧ  | Baud Rate   | 9600 | - | Close         |
| Pack  | FF      | •] | Pack Qty    | 1    |   | Start Monitor |
| ADDR  | 1       |    | Interval(S) | 1    | • |               |

| 2 3 4 5 6  | 7 8 9 10   | 11 12 13 14   | Serial Port  |
|--|--|---|--|
|  |  |   | Port COM24 Baud Rate 9600 Clo  |
| nformation   | T-+-1 AU 4204067 2 AU  | Temperature   | PollingCount 1 V Contr ADR 1 V Stop M  |
| 011age 49.430 0  | 101al An 4294907.3 An  | Tcell 1 27.7 °C   | 🖂 Auto Polling   |
| COC EE K   | OTAL NWH 4294907.5 KWH   | Tcell 2 27.7 °C   | System Status  |
| SOU 00 %   |  | Tcell 3 28.1 °C   | CHARGE-ON CHARGING CHG-LIMIT-OFF   |
| 50H. 100 w   |  | Tcell 4 28.2 C  | ODISCHARGE-ON ODISCHARGING OHEATER-OFF   |
| pacity 100800 mái  |  | MOS_T 29.5 C  | Alarn Status   |
| Cycle 1  |  | ENV_T 30.6 °C   | None   |
| oltage( <b>x</b> V)  |  |   |  |
| axVolt 12 3297   | MinVolt :  | 1 3294  | Protect Status   |
| cell 1 3294  | Vcell 9  | 3296  | None   |
| cell 2 3296  | Vcell 10   | 3296  |  |
| cell 3 3296  | Vcell 11   | 3296  |  |
| cell 4 3295  | Vcell 12   | 3297  | Fault Status<br>None   |
| cell 5 3296  | Vcell 13   | 3296  |  |
| cell 6 3296  | Vcell 14   | 3295  |  |
| cell 7 3296  | Vcell 15   | 3296  |  |
|  |  |   | Administrator Password   |
| P15S100A-9469-1.10 RMES<br>PmodbusToos V2.2(LOG)<br>Realtime Monitoring Di   | \$ SW: 9469109320184Z  | Pack SW: EED-AFSD-19071021-   | Administrator Password <b>FFFFFF</b><br>24 State: System Time: 2019-08-2<br>— — ×<br>Configuration Export Datas Change Language  |
| P155100A-9469-1.10 RES<br>PmodbusToos V2.2(LOG)<br>Realtine Monitoring Di<br>1 2 3 4   | 5 SW: 9469109320184Z   | Pack SW: EED-AFSD-19071021-<br>n Parameter Setting System<br>.0 11 12 13 14 1   | Administrator Password ****** Ct<br>24 State: System Time: 2019-08-2<br>Configuration Export Datas Change Language<br>Serial Port<br>Port COM24 Baud Rate 9600 Close   |
| P155100A-9469-1.10 MMS<br>PmodbusToos V2.2(LOG)<br>Realtime Monitoring Dy<br>1 2 3 4<br>Pack Information   | <b>5 SW</b> : 9469109320184Z   | Pack SW: EED-AFSD-19071021-<br>n Parameter Setting System<br>0 11 12 13 14 1<br>Temperature   | Administrator Password P***** Cl<br>24 State: System Time: 2019-08-2<br>- • ×<br>Configuration Export Datas Change Language<br>Serial Port<br>Port COM24 Baud Rate 9600 Close<br>PollingCount I Contr ADR 2 Stop Monitor   |
| P155100A-9469-1.10 RES<br>ProdbusToos V2.2(LOG)<br>Realtime Monitoring Dy<br><b>1 2 3 4</b><br>Pack Information<br>Pack Voltage 49.370   | 5 SW: 9469109320184Z           ata Save Memory Information           5 6 7 8 9 1           V Total AH 4294967.3 AH   | Pack SW: EED-AFSD-19071021-           n         Parameter Setting System           0         11         12         13         14         1           Temperature         Tcell 1         27.6         T   | Administrator Password  Administrator Password  Cl  System Time: 2019-08-2  Configuration Export Datas Change Language  Serial Port Port COM24 Baud Rate 9600 Close PollingCount I Contr ADR 2 Stop Monitor Cate Polling   |
| P155100A-9469-1.10 RES<br>ProdbusToos V2.2(LOG)<br>Realtime Monitoring Dr<br>1 2 3 4<br>Pack Information<br>Pack Voltage 49,370<br>Pack Current 0.00<br>Soc 56   | 5 SW: 9469109320164Z                     ata Save Memory Information         5         6         7         8         9         1           y         Total AH         4294967.3         AH         A         A         Total KWH         4294967.3         KW  | Pack SH: EED-AFSD-19071021-           n Parameter Setting System           0         11         12         13         14         1           Teaperature           H         Tcell 1         27.6         C           Tcell 2         27.5         C         C  | Administrator Password  Administrator Password  Class System Time: 2019-08-2 Configuration Export Datas Change Language Serial Port Port COM24 Baud Rate 9600 Close PollingCount 1 Contr ADR 2 Stop Monitor Auto Polling System Status   |
| P155100A-9469-1.10 RES<br>P155100A-9469-1.10 RES<br>PmodbusToos V2.2(LOG)<br>Realtime Monitoring Dr<br>1 2 3 4<br>Pack Information<br>Pack Voltage 49.370<br>Pack Current 0.00<br>SOC 56<br>SOH: 100   | 5 SM: 9469109320164Z                     ata Save Memory Information         5         6         7         8         9         1           5 V Total AH         4294967.3 AH         A         A         Total KWH         4294967.3 KW           %         %         %         %         %         %         %  | Pack SE: EED-AFSD-19071021-           n         Parameter Setting System           0         11         12         13         14         1           Teaperature           H         Tcell 1         27.6         C           Tcell 2         27.5         C         Tcell 3         27.9         C   | Administrator Password  Class Administrator Password  System Time: 2019-08-2 Configuration Export Datas Change Language Serial Port PollingCount I Contr ADR 2 Stop Monitor CharGE-ON CHARGING CHO-LIMIT-OFF   |
| P155100A-9469-1.10 BES<br>P155100A-9469-1.10 BES<br>PmodbusToos V2.2(LOG)<br>Realtine Monitoring Dr<br>1 2 3 4<br>Pack Information<br>Pack Voltage 49.370<br>Pack Current 0.00<br>SOC 56<br>SOH: 100<br>RemainCapacity 56270   | 5 SM: 9469109320184Z                 ata Save Memory Information       5         5       6       7       8       9       1         V       Total AH       4294967.3       AH         A       Total KWH       4294967.3       KW         %       %       %         mAH  | Pack SW: EED-AFSD-19071021-<br>n Parameter Setting System<br>0 11 12 13 14 1<br>Teaperature<br>Tcell 1 27.6 C<br>Tcell 2 27.5 C<br>Tcell 3 27.9 C<br>Tcell 4 28.0 C   | Administrator Password  Administrator Password  Class Configuration Export Datas Change Language Serial Port PollingCount I Contr ADR 2 Stop Monitor Auto Polling System Status CHARGENON CHARGING CHC-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHC-LIMIT-OFF User Status CHARGE-ON OLISCHARGING CHC-LIMIT-OFF User Status CHARGE-ON OLISCHARGING CHC-LIMIT-OFF User Status CHARGE-ON CHARGING CHC-LIMIT-OFF CHARGE-ON CHARGENG CHC-LIMIT-OFF CHARGENG CHC-LIMIT-OFF CHARGE-ON CHARGENG CHC-LIMIT-OFF CHARGENG CHCARGENG CHCARG |
| P155100A-9469-1.10<br>P155100A-9469-1.10<br>PmodbusToos V2.2(LOG)<br>Realtime Monitoring Dy<br>1 2 3 4<br>Pack Information<br>Pack Voltage 49.370<br>Pack Voltage 49.370<br>Pack Current 0.00<br>soc 56<br>SOH: 100<br>RemainCapacity 56270<br>FullCapacity 101040<br>Pathere Could 1  | S SW: 9469109320184Z<br>ata Save Memory Information<br>5 6 7 8 9 1<br>V Total AH 4294967.3 AH<br>A Total KWH 4294967.3 KW<br>%<br>%<br>mAH<br>mAH  | Pack SW: EED-AFSD-19071021-           n Parameter Setting System           0         11         12         13         14         1           Teaperature           H         Tcell 1         27.6         C           Tcell 1         27.5         C         Tcell 3         27.9           Tcell 4         28.0         C         MOS_T         29.6         C           ENV_T         31.1         C         C         C         C  | Administrator Password  Class Administrator Password  Class Configuration Export Datas Change Language Configur |
| P155100A-9469-1.10 RES<br>P155100A-9469-1.10 RES<br>PmodbusToos V2.2(LOG)<br>Realtine Monitoring Dr<br>1 2 3 4<br>Pack Information<br>Pack Voltage 49.370<br>Pack Current 0.00<br>SOC 56<br>SOH: 100<br>RemainCapacity 56270<br>FullCapacity 101040<br>Battery Cycle 1<br>Call Valtage (x)   | 5 SM: 9469109320184Z                 ata Save Memory Information       5         5       6       7       8       9       1         V       Total AH       4294967.3       AH         A       Total KWH       4294967.3       KW         %       %  | Pack SB: EED-AFSD-19071021-           n Parameter Setting System           0 11 12 13 14 1           Teaperature           Tcell 1 27.6 C           Tcell 2 27.5 C           Tcell 3 27.9 C           Tcell 4 28.0 C           MOS_T 29.6 C           ENV_T 31.1 C  | Administrator Password  Class Administrator Password  System Time: 2019-08-2 Configuration Export Datas Change Language Configuration Export Datas Change Language Serial Port PollingCount I Contr ADR 2 Stop Monitor Auto Polling System Status CHARGE-ON CHARGING CHB-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF Alara Status None   |
| P155100A-9469-1.10         DBES           PmodbusToos V2.2(LOG)         Realtine Monitoring Dr           Realtine Monitoring Dr         1         2         3         4           Pack Information         Pack Voltage         49.370         Pack Voltage         49.370           Pack Current         0.00         SOC         56         SOH: 100           RemainCapacity         56270         FullCapacity         101040           Battery Cycle         1         Cell Voltage (aY)         MaxVolt         14         32  | 3 SW: 9469109320184Z                 ata Save Memory Information       5         5       6       7       8       9       1         V       Total AH       4294967.3       AH         A       Total KWH       4294967.3       KW         %  | Pack SW: EED-AFSD-19071021-         n         Parameter Setting System         0       11       12       13       14       1         Image: Teaperature       Tcell 1       27.6       C       C       Tcell 2       27.5       C         Image: Tcell 3       27.9       C       Tcell 4       28.0       C       MOS_T       29.6       C       ENV_T       31.1       C         15       3291       321       321       321 </td <td>Administrator Password</td> | Administrator Password   |
| P155100A-9469-1.10         DBES           ProdbusToos V2.2(LOG)         Realtine Monitoring Dr           I         I         I           Pack Information         Pack Voltage         49.370           Pack Voltage         49.370           Pack Current         0.00           SOC         56           SOH:         100           RemainCapacity         56270           FullCapacity         101040           Battery Cycle         1           Cell Voltage (xV)         HarVolt           HarVolt         14           3291         3291  | S SH: 9469109320184Z                 ata Save Memory Information       5         5       6       7       8       9       1         V       Total AH       4294967.3       AH         A       Total KWH       4294967.3       KW         %  | Pack SW: EED-AFSD-19071021-           n         Parameter Setting System           0         11         12         13         14         1           Teaperature           Tcell 1         27.6         C           Tcell 2         27.5         C         Tcell 3         27.9         C           Tcell 3         27.9         C         Tcell 4         28.0         C           M05_T         29.6         C         ENV_T         31.1         C           15         3291         3292         3292         3292         3292         3292  | Administrator Password   |
| P155100A-9469-1.10         PES           PPodbusTocs V2.2(LOG)         Realtine Monitoring Dr           Realtine Monitoring Dr         1         2         3         4           Pack Information         Pack Voltage         49, 370         7         7           Pack Voltage         49, 370         7         7         7         7           Pack Voltage         49, 370         7 | S SW: 9469109320184Z                 ata Save Memory Information       5         5       6       7       8       9       1         V       Total AH       4294967.3       AF         A       Total KWH       4294967.3       KW         %  | Pack SW: EED-AFSD-19071021-         n Parameter Setting System         0 11 12 13 14 1         Temperature         Tccll 1 27.6 °C         Tccll 3 27.9 °C         Tccll 4 28.0 °C         MOS_T 29.6 °C         ENV_T 31.1 °C  | Administrator Password   |
| P155100A-9469-1.10         PES           P155100A-9469-1.10         PES           PmodbusToos V2.2(LOG)         Realtime Monitoring Dy           1         2         3           Pack Information         Pack Voltage         49.370           Pack Voltage         49.370           Pack Voltage         49.370           Pack Current         0.00           SOC         56           SOH:         1000           RemainCapacity         56270           FullCapacity         101040           Battery Cycle         1           Cell Voltage (aV)         MaxVolt           MaxVolt         14         32           Vecell 1         3292         3292           Vecell 3         3292         3292  | S SM: 9469109320184Z                 ata Save Memory Information                 5       6       7       8       9       1         V       Total AH       4294967.3       AF         A       Total KWH       4294967.3       AF         %  | Pack SW: EED-AFSD-19071021-         In Parameter Setting System         0       11       12       13       14       1         Teaperature         H       Tcaperature         H       Tcell 1       27.5       C         Tcell 3       27.9       C       T         Tcell 4       28.0       C       MOS_T       29.6       C         MOS_T       29.6       C       ENV_T       31.1       C         15       3291       3282       3282       3282       3282   | Administrator Password  Cdate:  System Time: 2019-08-2  Configuration Export Datas Change Language  Serial Port PollingCount B Contr ADR 2 Stop Monitor Auto Polling  System Status CHARGH-ON CHARGING CHARGING CHARGING CHARGING CHARGE-ON Protect Status None Fault Status   |
| P155100A-9469-1.10         DES           P155100A-9469-1.10         DES           PmodbusToos V2.2(LOG)         Realtime Monitoring Dy           1         2         3           Pack Information         Pack Voltage         49.370           Pack Voltage         49.370           Pack Voltage         49.370           Pack Current         0.00           SOC         566           SOH:         1000           RemainCapacity         56270           FullCapacity         101040           Battery Cycle         1           Cell Voltage (aY)         Mayolt           Mayolt         14           202         Vcell 1           3292         Vcell 4           Veell 4         3292   | S SM: 9469109320184Z                     ata Save Memory Information                     5         6         7         8         9         1           V         Total AH         4294967.3         AF                     A         Total KWH         4294967.3         KN                     %   MAH   8   <td>Pack SW: EED-AFSD-19071021-         n Parameter Setting System         0 11 12 13 14 1         Temperature         Tcell 1 27.6 C         Tcell 3 27.9 C         Tcell 4 28.0 C         MH         15 3291         3 3292         3 3292         3 3292         3 3292         3 3292         3 3292         3 3292</td> <td>Administrator Password  Cdate:  Administrator Password  System Time: 2019-08-2  Configuration Export Datas Change Language  Serial Port PollingCount  Port COM24 Baud Rate 9600 Close PollingCount  Contr ADR  System Status CHARGE-ON  CHARGING  CHARGING  CHARGE-OFF  Alare Status None  Fault Status None</td>   | Pack SW: EED-AFSD-19071021-         n Parameter Setting System         0 11 12 13 14 1         Temperature         Tcell 1 27.6 C         Tcell 3 27.9 C         Tcell 4 28.0 C         MH         15 3291         3 3292         3 3292         3 3292         3 3292         3 3292         3 3292         3 3292   | Administrator Password  Cdate:  Administrator Password  System Time: 2019-08-2  Configuration Export Datas Change Language  Serial Port PollingCount  Port COM24 Baud Rate 9600 Close PollingCount  Contr ADR  System Status CHARGE-ON  CHARGING  CHARGING  CHARGE-OFF  Alare Status None  Fault Status None   |
| P155100A-9469-1.10         DES           P155100A-9469-1.10         DES           PmodbusToos V2.2(LOG)         Realtime Monitoring Dy           1         2         3           Pack Information         Pack Voltage         49.370           Pack Voltage         49.370           Pack Current         0.00           SOC         566           SOH:         1000           RemainCapacity         56270           FullCapacity         101040           Battery Cycle         1           Cell Voltage (sY)         MarVolt           MarVolt         14         3291           Vcell 1         3292           Vcell 3         3292           Vcell 4         3292           Vcell 5         3292           Vcell 6         3292  | S SM: 9469109320184Z         ata Save Memory Information         5       6       7       8       9       1         V       Total AH       4294967.3       AF         A       Total KWH       4294967.3       KN         %       mAH       NinVolt         %       Vcell 10       Vcell 11         Vcell 13       Vcell 13       Vcell 13   | Pack SW: EED-AFSD-19071021-         n         Parameter Setting System         0       11       12       13       14       1         Teaperature         H       Tcell 1       27.6       C         Tcell 2       27.5       C       T         Tcell 3       27.9       C       T         Tcell 4       28.0       C       MOS_T       29.6       C         MOS_T       29.6       C       E       NV_T       31.1       C         15       3291       3292  | Administrator Password  Cdate:  System Time: 2019-08-2  Configuration Export Datas Change Language  Serial Port PollingCount Contr ADR Close PollingCount Contr ADR Contr ADR System Status CHARGE-ON CHARGING CHO-LIMIT-OFF DISCHARGE-ON OISCHARGING CHO-LIMIT-OFF Contract Status None  Fault Status None   |
| P155100A-9469-1.10         DEES           P155100A-9469-1.10         Restance           PmodbusToos V2.2(LOG)         Realtine Monitoring Dr           Realtine Monitoring Dr         1         2         3         4           Pack Information         Pack Voltage         49.370         Pack Voltage         49.370           Pack Voltage         49.370         Pack Voltage         49.370         Pack Voltage         49.370           Pack Current         0.00         SOC         56         SOH: 100         RemainCapacity         56270           FullCapacity         101040         Battery Cycle         1         101040           Battery Cycle         1         101040         Battery Cycle         1           Vecll 1         3291         Vecll 1         3292         Vecll 1         3292           Vecll 1         3292         Vecll 4         3292         Vecll 5         3292         Vecll 6         3292           Vecll 1         3292         Vecll 6         3292         Vecll 7         3292  | S SW: 9469109320184Z                 ata Save Memory Information                 5       6       7       8       9       1         V       Total AH       4294967.3 AF                                 A       Total AH       4294967.3 KN   <td>Pack SH: EED-AFSD-19071021-         n Parameter Setting System         0 11 12 13 14 1         Teaperature         Tcell 1 27.6 C         Tcell 2 32.6 C         MH         15 3291         3292         3292         3292         3292         3292         3292         3292         3292         3292         3291</td> <td>Administrator Password  Cd Administrator Password  System Time: 2019-08-2 Configuration Export Datas Change Language Sexial Port PollingCount I Contr ADR 2 Stop Monitor Auto Polling System Status CHARGE-ON CHARGING CHA-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF Fault Status None</td> | Pack SH: EED-AFSD-19071021-         n Parameter Setting System         0 11 12 13 14 1         Teaperature         Tcell 1 27.6 C         Tcell 2 32.6 C         MH         15 3291         3292         3292         3292         3292         3292         3292         3292         3292         3292         3291  | Administrator Password  Cd Administrator Password  System Time: 2019-08-2 Configuration Export Datas Change Language Sexial Port PollingCount I Contr ADR 2 Stop Monitor Auto Polling System Status CHARGE-ON CHARGING CHA-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF DISCHARGE-ON OLISCHARGING CHB-LIMIT-OFF Fault Status None   |

## 5 Application of "CHG Limiter" Button

When a battery is used alone, it's not necessary to set the technical parameters by the BMS Software. Neata engineer set and check the suitable parameters before delivery.

When some batteries are used in parallel, it's vital to set "CHG Limiter" button related to charging limited current by the BMS Software. You must set the parameter of every battery by three steps below:

Step1: In the "Realtime Monitoring" display interface, there is an "Administrator Password" frame. Enter password "Pz#188178" in the frame.

Step2: Click "CHG Limiter" button to be in "Open" mode, then the maximum charging current of the battery is 20A.

Step3: Close the software.

| - PbmsTools V1.02            |           |         |                            |           |                         |                                   |          |   |  |  |
|------------------------------|-----------|---------|----------------------------|-----------|-------------------------|-----------------------------------|----------|---|--|--|
| Realtime Monito              | oring Mul | ti Moni | toring Memory              | Informat  | ion Param               | eter Se                           | tting Sy | vstem Configuration Change Language   |  |  |
| 1 2 3                        | 4 5       | 6 7     | 8 9 10                     | 11 12     | 13 14                   | 15                                | Auto     | Serial Port           Port         COM3           Baud Rate         9600           Port         Close |  |  |
| Pack Information Temperature |           |         |                            |           |                         | Pack FF - Pack Qty 2 Stop Monitor |          |   |  |  |
| Pack Voltage                 | 53.323    | ٧       |                            |           |                         |                                   |          | ADDR 0 Interval(S) 1  |  |  |
| Pack Current                 | 0.00      | A       | Tcell 1                    | 23.6 ℃    | Tcell 2                 | 23.7                              | C        | System Status   |  |  |
| SOC                          | 100       | %       |                            |           |                         |                                   |          | ●CHG-MOS-ON ●CHARGING ●CHG-LIMIT-OFF ●ACin  |  |  |
| SOH                          | 100       | %       | Tcell 3                    | 23.3 ℃    | Tcell 4                 | 23.4                              | ť        | ODSG-MOS-ON ODISCHARGING OHEATER-OFF OF   |  |  |
| RemainCapacity               | 52480     | mAH     |                            |           |                         |                                   |          | Alarm Status  |  |  |
| FullCapacity                 | 52740     | mAH     | MOS T 2                    | 25.2 °C   | ENV T                   | 26.8                              | C        | AVID  |  |  |
| CHG-DSG Cycle                | 1         |         |                            |           | 1999 1 <del></del> 99 1 |                                   |          | Protect Status  |  |  |
| Cell Voltage(m               | V)        |         |                            |           |                         |                                   |          | None  |  |  |
| MaxVolt 16                   | \$335     |         | Mi                         | nVolt 1   | 3332                    |                                   |          | ·   |  |  |
| Vcell 1                      | 3332      |         | Vc                         | ell 9     | 3332                    |                                   |          | Fault Status  |  |  |
| Vcell 2                      | 3334      |         | Vce                        | 11 10     | 3332                    |                                   |          | None  |  |  |
| Vcell 3                      | 3332      |         | Vce                        | 11 11     | 3334                    |                                   |          | Switch Control  |  |  |
| Vcell 4                      | 3332      |         | Vce                        | 11 12     | 3334                    |                                   |          | CHG Circuit Open Close DSG Circuit Open Close   |  |  |
| Vcell 5                      | 3332      |         | Vce                        | 11 13     | 3332                    |                                   |          | Sound Alarm Open Close CHG Limiter Open Close   |  |  |
| Vcell 6                      | 3332      |         | Vce                        | 11 14     | 3332                    |                                   |          | LED Alarm Open Close Shutdown Shutdown  |  |  |
| Vcell 7                      | 3332      |         | Vce                        | 11 15     | 3332                    |                                   |          |   |  |  |
| Vcell 8                      | 3334      |         | Vce                        | 11 16     | 3335                    |                                   |          | Administrator Password  |  |  |
| Version: P16S50A-54          | 417L-1.10 | S/N Ba  | <b>rCode</b> : 4850-2701-2 | 201701288 | COMM Stat               | e: Enabl                          | e   Stat | e: Get Alarm Info OK System Time: 2017-12-04 17:58:0  |  |  |

#### Annex1 RS232 Communication

BMS can communicate with "Bms Tools-EN" software via RS232 port so that various battery information is displayed in PC, including battery voltage, current, temperature, status, SOC, SOH and production information etc.. When using RS232 port, baud rate should be set to 9600.



The interface uses a vertical 6P6C RJ11 socket (round pin), pin definitions in the following table:

| RJ45/RJ11 port | no | RS232 | RS485     | RS485     |
|----------------|----|-------|-----------|-----------|
| 12345678       | 1  | NC    | B: DATA - | B: DATA - |
|                | 2  | NC    | A: DATA+  | A: DATA+  |
|                | 3  | ТХ    | NC        | NC        |
|                | 4  | RX    | NC        | NC        |
|                | 5  | GND   | NC        | NC        |
| 1 2 3 4 5 6    | 6  | NC    | NC        | NC        |
|                | 7  |       | A: DATA+  | A: DATA+  |
|                | 8  |       | B: DATA - | B: DATA - |

## Annex2 RS485 Communication

When using the batteries in parallel, Master Pack can communicate with Slave Pack via RS485 port, so the information of Master Pack and each Slave Pack can be displayed in the PC by

"Bms Tools-EN" software. Using RS485 communication between systems, the default setting is 9600 baud.

The interface uses a vertical 8P8C RJ45 socket (round pin), pin definitions in the following table:

| Pin No.● | Definition description |
|----------|------------------------|
| 1, 8•    | RS485−B•               |
| 2、7•     | RS485−A•               |
| 3、6•     | GND                    |
| 4, 5•    | NC•                    |
|          | 5678                   |

## Annex3 Band Switch Address Code

Band switch uses four DIP switches for setting mailing address of the battery system when it is used in parallel.



## Table A-3 Band switch address code

| add  | dial the | code switch |          |     |                         |
|------|----------|-------------|----------|-----|-------------------------|
| ress |          |             | position |     |                         |
| •    | #1●      | #2●         | #3∙      | #4● | •                       |
| 0    | OFF      | OFF         | OFF      | OFF | Independent, single use |
| 1    | ON       | OFF         | OFF      | OFF | Set to Pack<br>(main)   |
| 2    | OFF      | ON          | OFF      | OFF | Set to Pack1            |
| 3    | ON       | ON          | OFF      | OFF | Set to Pack2•           |
| 4    | OFF      | OFF         | ON       | OFF | Set to Pack3            |
| 5    | ON       | OFF         | ON       | OFF | Set to Pack4            |
| 6    | OFF      | ON          | ON       | OFF | Set to Pack5            |
| 7    | ON       | ON          | ON       | OFF | Set to Pack6            |
| 8    | OFF      | OFF         | OFF      | ON  | Set to Pack7            |
| 9    | ON       | OFF         | OFF      | ON  | Set to Pack8            |
| 10   | OFF      | ON          | OFF      | ON  | Set to Pack9            |
| 11   | ON       | ON          | OFF      | ON  | Set to Pack10           |
| 12   | OFF      | OFF         | ON       | ON  | Set to Pack11           |
| 13   | ON       | OFF         | ON       | ON  | Set to Pack12           |
| 14   | OFF      | ON          | ON       | ON  | Set to Pack13           |
| 15   | ON       | ON          | ON       | ON  | Set to Pack14           |