

UDAN iBMS Upper Utility

V3.1

User manual

Anhui UDAN Technology Co., Ltd.

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Revision record

S/N	Edition	Revision date	Type	Revised content
1	V3.0	2023-03-06	A	First Edition
2	V3.1	2023-10-07	M	Replace the image with the English version

A- Add,M- Modify,D- Delete

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1 Operating environment

1.1 Hardware environment

1.1.1. Computer (operating system of win 7 and above)

1.1.2. Communication tools:

- E7 and F7 series products: using USB to 485 adaptor
- Other Udan BMS: Use USBCAN BOX.

Currently supported models are as follows:

- USBCANII;
- MiniUSBCAN;
- PCAN;
- VectorCAN;
- Chuangxin Technology: CANalyst-II;
- Chuangxin Technology: USB-CAN adaptor;
- ZLG: USBCAN-2E-U ;

1.2 Software environment

- USB to 485 driver
- USB CAN BOX driver
- iBMS Upper Utility software

Utility software download link: https://www.ievcloud.com/burner_en.html



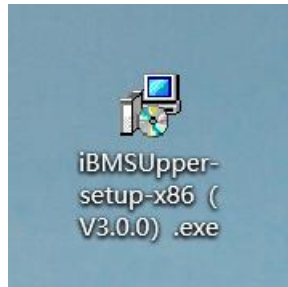
2 Utility software installation

2.1 Precautions before installation

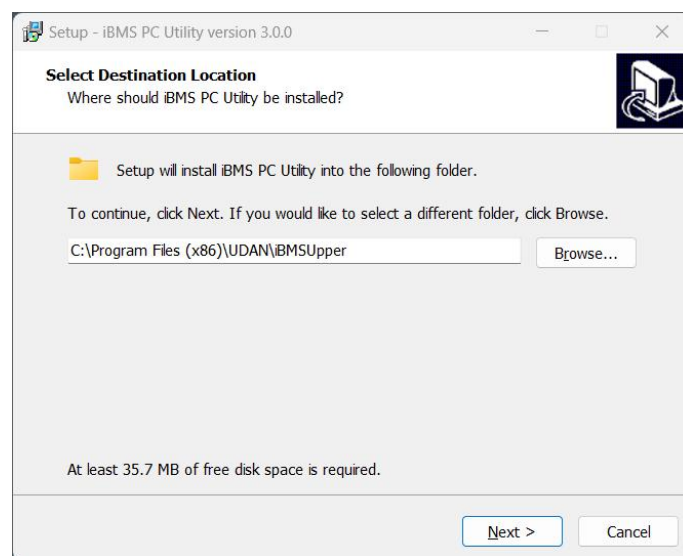
- It is recommended to temporarily close the antivirus software before installation, otherwise it may cause installation failure or abnormal operation;
- The installation directory must be in full English, and no other language can be used, otherwise it may not run;

2.2 Installation steps

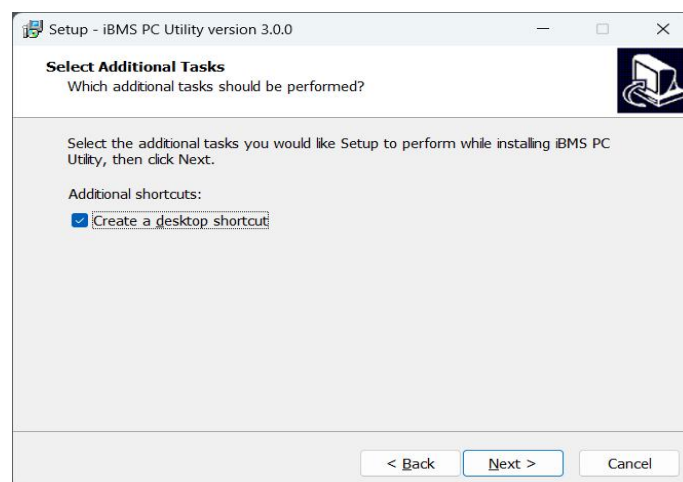
- Double click the Upper Utility software. exe file;



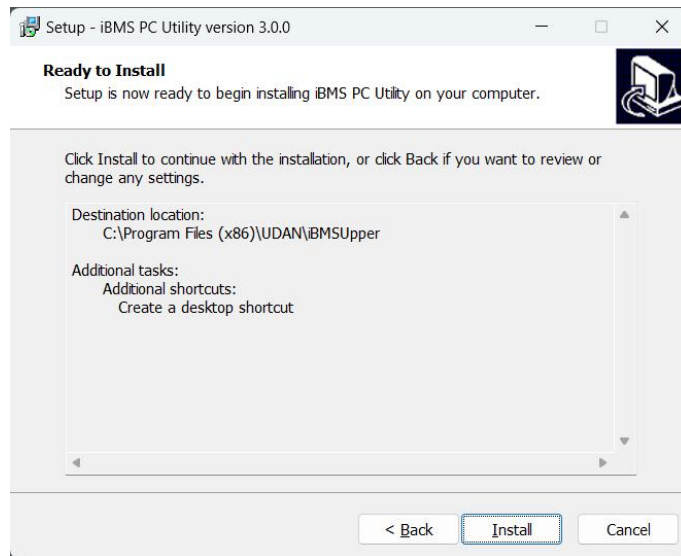
- Select the installation folder. The following figure shows the default installation location. Click "next";



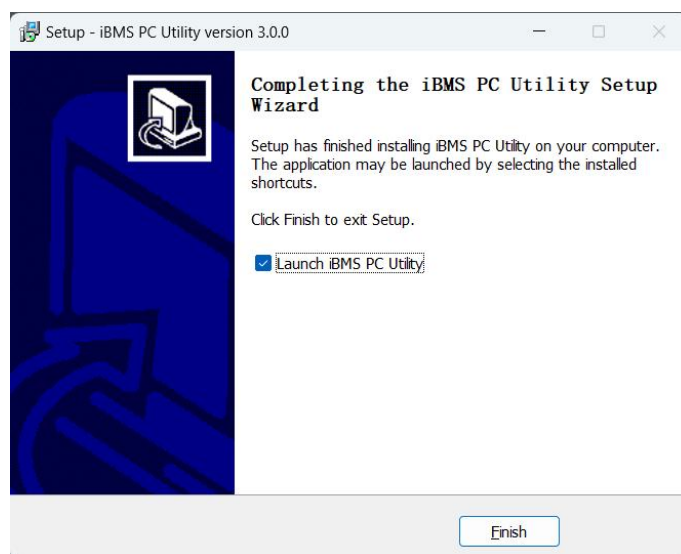
- Confirm whether to create a desktop shortcut (selected by default), and click "next";



- Confirm that the above configuration is correct, and click "Install";



- The installation is completed, and it is checked by default. Click "Finish" to start the upper computer.



2.3 Software Updates

The iBMS Upper Utility computer is updated through online upgrade. If the server has a newer version, under normal network connection conditions, the host computer automatically detects and downloads the

installation package upon startup. The next time you start the upper computer, an update prompt will automatically pop up. Click OK to install the latest software, and the steps are the same as above.

3 Introduction to Upper Utility software

The iBMS Upper Utility software includes six functional modules, namely login, system status, system configuration, parameter calibration&forced control, program upgrade, and historical data.

This iBMS Upper Utility software is compatible with all UDAN BMS. After connecting to BMS, it will automatically identify the BMS product model and switch to the corresponding interface. Currently, there are mainly three product interfaces:

- E7/F7 integrated series BMS with MOSFET:

Including F720, F722, F723, and E720

- A5/A7/C7 all-in-one machine, Distributed series BMS :

Including all-in-one machines: A530/A535, A550/A555, A560 A565, A570 A575, B700, B702

Distributed series BMS: C700, C740, P20

- P700 energy storage series products:

Low voltage 48V ESS BMS: P700

4 E7/F7 series Upper Utility interface

4.1 Top functions

Communication message: If checked, messages during communication can be recorded;

Real-time storage: When checked, an Excel file can be created in the directory where the Upper Utility is located and the folder can be opened automatically.


The system status interface data can be saved in real-time at an interval of 2 seconds;

Communication ports:

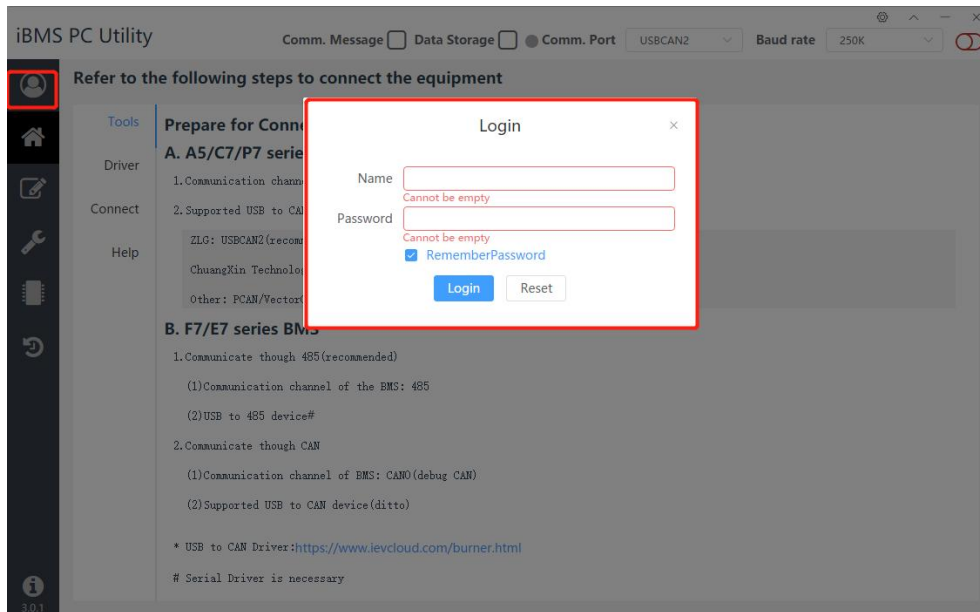
The dot on the left is displayed in red when Upper Utility is not communicating, and green when the communication is normal.

The drop-down box on the right allows you to select different USB CAN and 485 device ports. Communication can only be normal if the selected device port is consistent with the actual one used;

Baud rate: If using a CAN device, the baud rate is 250K. If a 485 device is used, the baud rate is 9600;

Start button : After the above configuration is completed, click this button to enable communication between the Upper Utility and the BMS.

4.2 Login interface



Notes:

- When not logged, and can only view the interface and export data. You cannot modify the system configuration.
- After logging in to the account, you can use all the functions of the upper computer: viewing system status, configuring system parameters, upgrading firmware, exporting data, and so on.
- Offline login: In order to facilitate working in some areas without network, the upper computer supports offline login. After logging in with network, the upper computer will remain logged in, even if it enters the area without network, and can perform related operations.

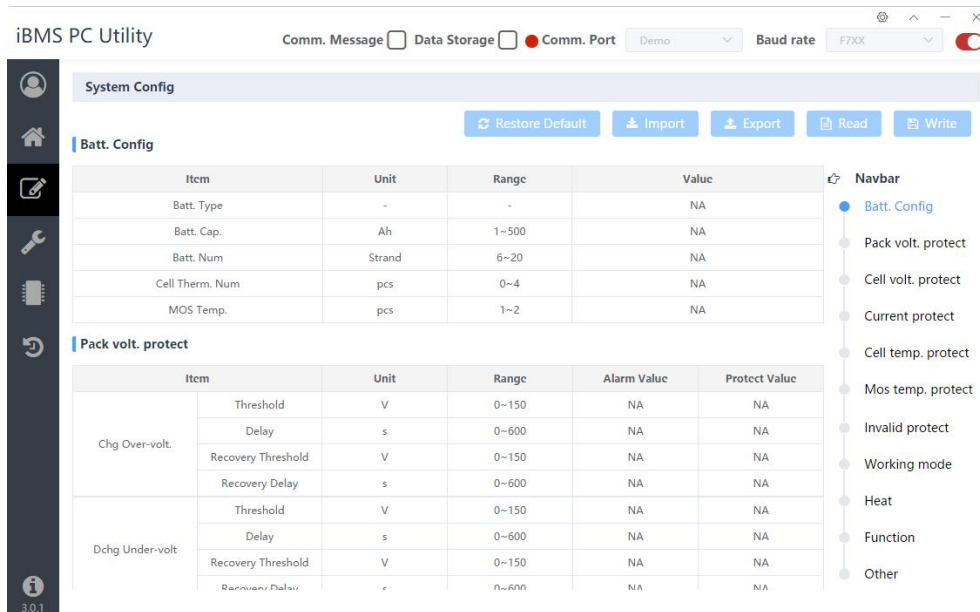
4.3 System interface



Notes:

- The main interface displays the overall information of the battery such as voltage, current, and SOC;
- The main interface displays the voltage of each string of cells and the temperature of all temperature sensors;
- Display the working status of the BMS;
- Display network configuration information of BMS;
- Display the cumulative information of battery charge and discharge.

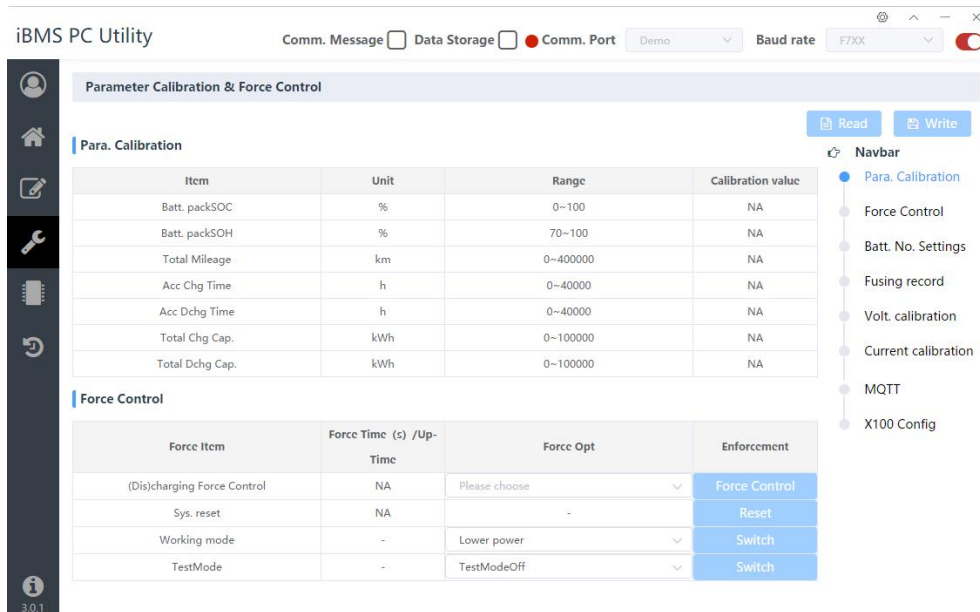
4.4 System configuration



Notes:

- Changes to some parameters will be associated with changes to other relevant parameters. For example, when changing the number of battery cells in series, the Upper Utility automatically calculates the corresponding total voltage overvoltage threshold value;
- Threshold values can be changed in batches, but all need to be within range limits;
- Pay attention to units when changing thresholds.
- Modification steps:
 - Click Read.
 - Modify parameters (or import parameters).
 - Click Write.
 - Successful writing.

4.5 Parameter calibration&forced control



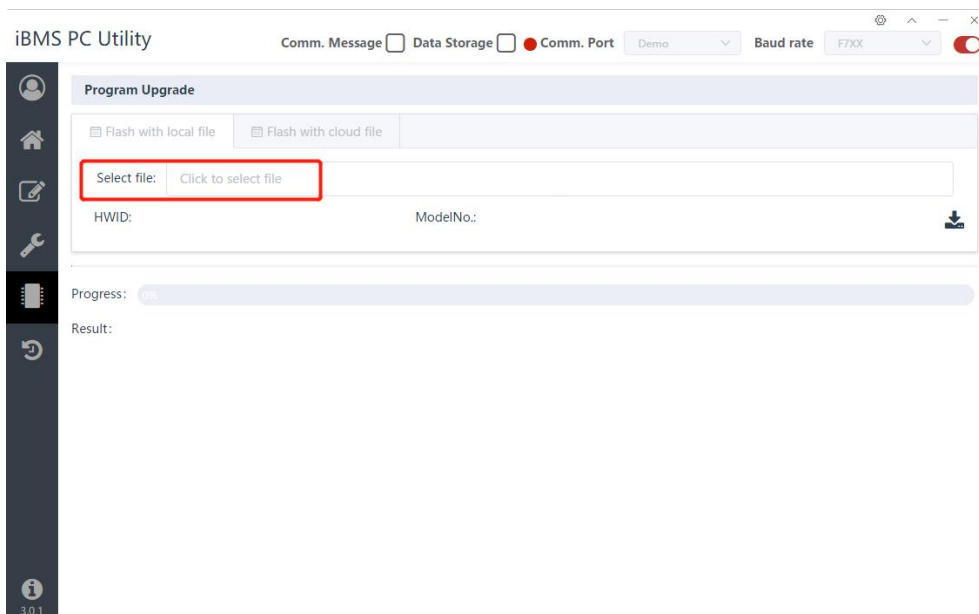
Notes:

- When switching the working mode, the upper Utility software actively stops communicating with the MOSFET BMS, and the data is no longer updated;
- When successfully switching to other working modes, if you need to use the upper Utility to wake up BMS, please restart the communication switch button.
- When force controlling MOS, it is necessary to set the control time, otherwise force control cannot be performed.
- System reset means restarting the BMS. It is recommended to operate when there is no current in the circuit (when the system is idle).
- Test mode cannot be automatically turned off after being turned on, so after testing, you need to click switch again to turn off the test mode.
- Other parameters do not need to be modified when there is no demand, just keep them as they are.

- Voltage calibration: This function is mainly used to calibrate the voltage/current acquisition of BMS individual cells, just keep it as it is.
- X100 configuration: This function is only available for products using X100 SOC indicator and can be ignored.

4.6 Firmware Upgrade

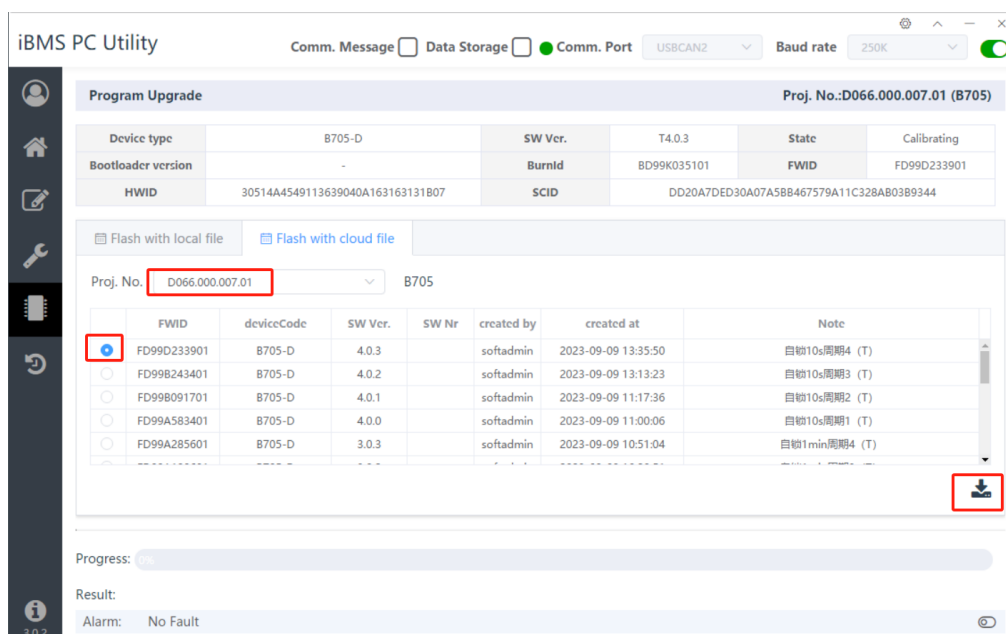
Local firmware upgrade



Notes:

- When upgrading, the BMS needs to be in a power-on operation state, and the circuit cannot have a charging and discharging current exceeding 3A.
- Click "Please click to select a file" and select the file to be upgraded in the pop-up window.
- Click the download button on the right to start the upgrade process.
- Observe the burning progress and status below and wait for the upgrade to complete.

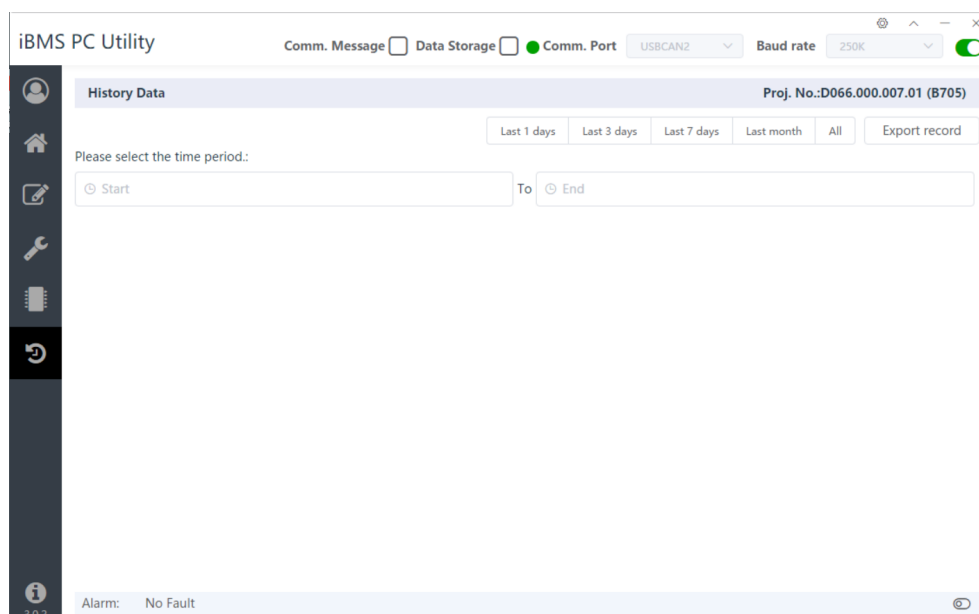
Online firmware upgrading



Notes:

- When upgrading, the BMS needs to be in a power-on operation state, and the circuit cannot have a charging and discharging current exceeding 3A.
- Click "Project Number" and select the project number from the drop-down list to view the firmware under the corresponding project.
- Select the required firmware and check the firmware.
- Click the download button on the right to start the upgrade process.
- Observe the burning progress and status below and wait for the upgrade to complete.

Historical data



Notes:

F7 and E7 series BMS do not have local history storage, ignoring this function.

5 A5/C7/P720 series BMS Upper Utility software UI

5.1 Software top features

Communication message: If checked, messages during the communication process can be recorded;

Real time storage: After checking, an Excel file can be created in the directory where the upper computer is located and the folder can be automatically opened. The system status interface data can be saved in real time every 2 seconds;


Communication port:

The dot on the left is displayed in red when there is no communication on the upper computer, and in green when communication is normal.

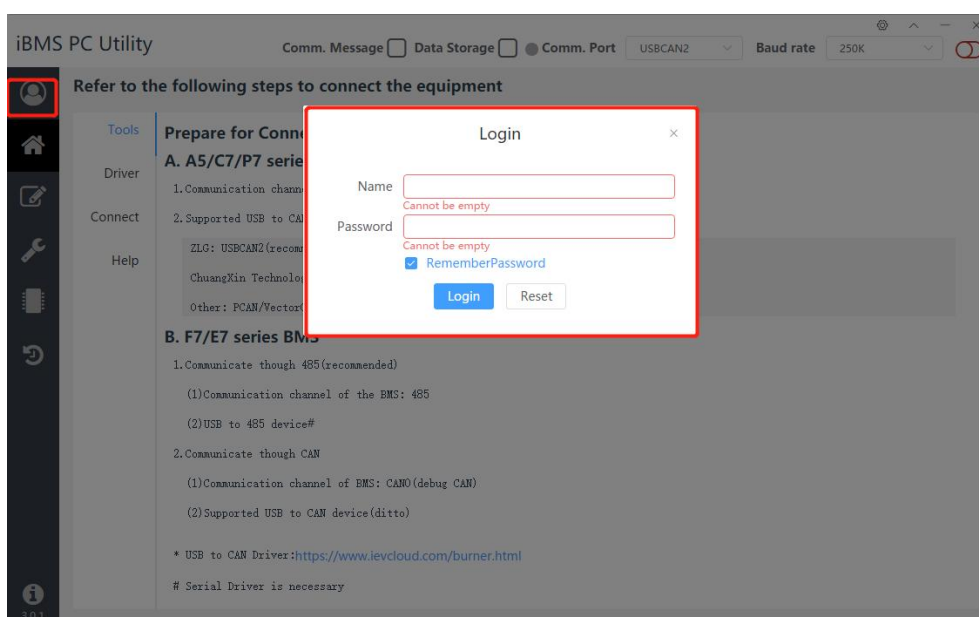
The drop-down box on the right allows you to select different USBCAN . Only

when the selected device port is consistent with the actual one used can communication be normal;

Baud rate: If using a CAN device, the baud rate is 250K.

Start button : After the above configuration is completed, click this button to enable communication between the upper Utility software and BMS.

5.2 Login interface

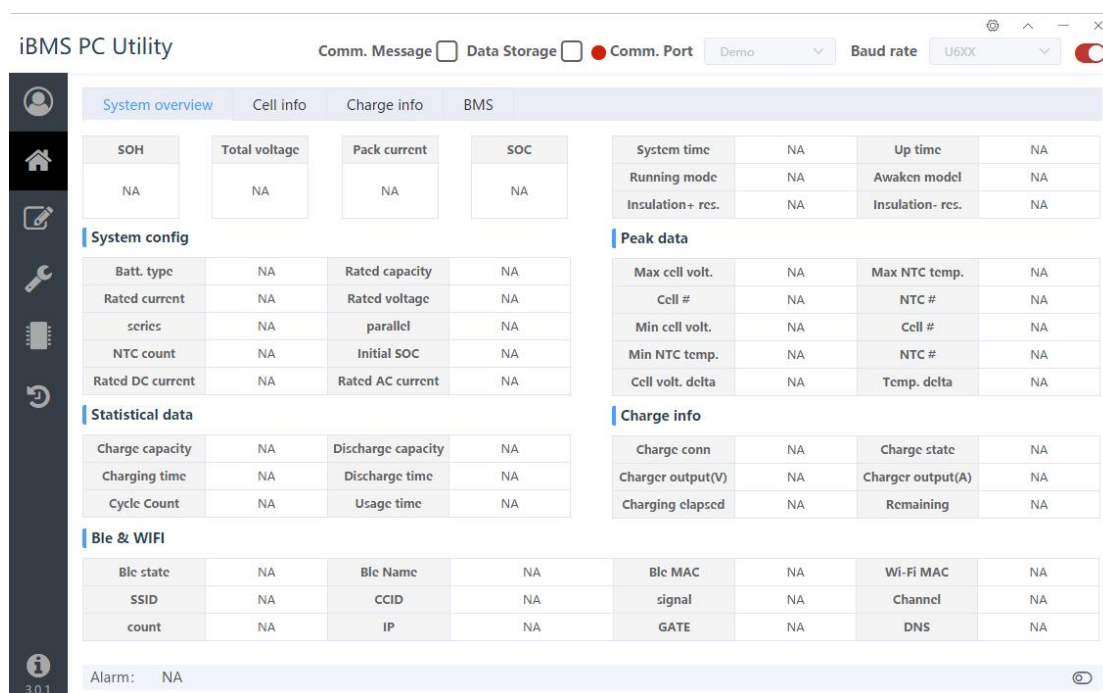


Notes:

- When not logged in to the account, can only view the interface and export data, and cannot modify system configuration;
- After logging in to the account, you can use all the functions of the upper computer: viewing system status, configuring system parameters, upgrading firmware, exporting data, and so on.
- Offline login: For the convenience of working in some areas without a network, the upper computer supports offline login. After logging in with a network, the upper

computer will remain logged in and can perform related operations even when entering the area without a network.

5.3 System interface



Notes:

- The system interface displays the overall status of the battery, including information such as SOC, SOH, current, voltage, etc.
- The system interface displays the relevant configurations of the battery, including battery type, capacity, voltage, power, etc.
- The system interface displays the cumulative information, extreme value information, charging status, etc. of the current battery.
- The system interface displays real-time information of network module (DTU) devices.
- The bottom is the system's fault alarm information.

iBMS PC Utility

Comm. Message ☐ Data Storage ☐ Comm. Port ☒ USB CAN2 Baud rate 250K

System overview Cell info Charge info BMS Proj. No.: D066.000.007.01 (B705)

Over-volt. Under-volt. Open-wire Balancing Temp. probe shorted NC

BMU-1	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	T1	T2	T3	T4	T5	T6	T7	T8
PortA	3396	3391	3388	3390	3387	3386	3395	3387	3385	3389	3384	3385	3397	3393	26	26	27	26	NC	NC	NC	NC
PortB	3401	3390	3386	3390	3386	3383	3391	3383	3381	3389	3390	3393	3383	3383	26	26	27	26	NC	NC	NC	NC

BMU-2	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	T1	T2	T3	T4	T5	T6	T7	T8
PortA	3446	3440	3435	3439	3436	3435	3443	3433	3432	3435	3433	3430	3445	3440	26	26	26	26	NC	NC	NC	NC
PortB	3449	3437	3435	3437	3436	3431	3438	3431	3430	3429	3436	3436	3441	3429	26	26	25	26	NC	NC	NC	NC

BMU-3	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	T1	T2	T3	T4	T5	T6	T7	T8
PortA	3556	3552	3551	3550	3548	3547	3552	3545	3545	3548	3546	3544	3554	3551	26	27	27	27	NC	NC	NC	NC
PortB	3560	3549	3548	3549	3546	3545	3553	3543	3540	3544	3546	3552	3553	3543	27	26	26	26	NC	NC	NC	NC

BMU-4	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	T1	T2	T3	T4	T5	T6	T7	T8
PortA	3474	3461	3460	3461	3456	3456	3468	3456	3457	3453	3454	3451	3467	3464	3462	3459	3459	3453	26	25	26	26	26	26	26	26

BMU-5	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	T1	T2	T3	T4	T5	T6	T7	T8
PortA	3481	3452	3449	3453	3449	3450	3459	3450	3445	3449	3449	3444	3459	3456	3453	3456	3452	3444	26	25	25	26	25	26	25	25

Alarm: No Fault

Notes:

- The individual cell interface displays cell voltage and temperature information.
- The individual cell interface displays the highest cell information, highest cell information, and balancing status.

iBMS PC Utility

Comm. Message ☐ Data Storage ☐ Comm. Port ☒ Demo Baud rate U6XX

System overview Cell info Charge info BMS

Charging plugging state

SCH_T1 Temp.	NA	FCH_T1 Temp.	NA	SCH_T1 Volt.	NA	FCH_T1 Volt.	NA
SCH_T2 Temp.	NA	FCH_T2 Temp.	NA	SCH_T2 Volt.	NA	FCH_T2 Volt.	NA
SCH_T3 Temp.	NA	-	-	SCH_T3 Volt.	NA	-	-

Charger to BMS

Connection	NA	ON/OFF	NA	CC Resistance	NA	CC voltage	NA
State	NA	CC/CV	NA	CC2 Resistance	NA	CC2 voltage	NA
Output(V)	NA	Output(A)	NA	CP PWM freq.	NA	CP PWM Duty	NA
Time charged	NA	-	-	Time to charge	NA	-	-

(Dis)Charging self-diag.

Dchg Self-Diag Flt	NA	Dchg Diag. Flt Flag	NA	Dchg Diag. Flt Action	NA	Other Dchg Flt	NA
Chg Self-Diag Flt	NA	Chg Diag. Flt Flag	NA	Chg Diag. Flt Action	NA	Other Chg Flt	NA
Chg GB Comm. Flt	NA	-	-	-	-	-	-

Elec. lock state

Elec. lock driving state	NA	Elec. lock actual state	NA	-	-	-	-
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Alarm: NA

Notes:

- The charging information interface displays information about relevant signals during the charging process.
- The functions displayed in this interface are compatible with all BMS systems, and some BMS systems only have some of them.

The screenshot shows the iBMS PC Utility software interface. At the top, there are tabs for 'System overview', 'Cell info', 'Charge info', and 'BMS'. The 'BMS' tab is selected. Below the tabs, there is a 'Proj. No.:D066.000.007.01 (B705)' label. The main content area is divided into three sections: 'Hiss state', 'HV detection', and 'Hall state'. The 'Hiss state' section contains a table with columns 'HSS1' through 'HSS8', 'State', 'Feedback current', and 'Feedback voltage'. The 'HV detection' section contains a table with columns 'B+', 'HV1', 'HV2', 'HV3', 'HV4', 'HV5', and 'P-'. The 'Hall state' section contains a table with columns 'Hall index', 'Current', 'Monitor point voltage', 'Zeroing values within the range of', and 'Zero-current calib.'. On the right side, there is a 'Navbar' with a list of items: 'Hiss state', 'HV detection', 'Hall state', 'Shunt state', 'Signal detection', 'On-board volt.', 'On-board temp.', and 'BMU Info'. At the bottom, there is an 'Alarm' status bar showing 'No Fault'.

HV detection		State	Feedback current	Feedback voltage
BCU	HSS1	Open	0.000A	0.000V
	HSS2	Open	0.000A	0.022V
	HSS3	Open	0.000A	0.011V
	HSS4	Open	0.000A	0.011V
	HSS5	Open	0.000A	0.000V
	HSS6	Open	0.000A	0.000V
	HSS7	Open	0.000A	Invalid
	HSS8	Open	0.000A	Invalid

B+	HV1	HV2	HV3	HV4	HV5	P-
0.0V	0.0V	0.0V	0.0V	Invalid	Invalid	1.693V

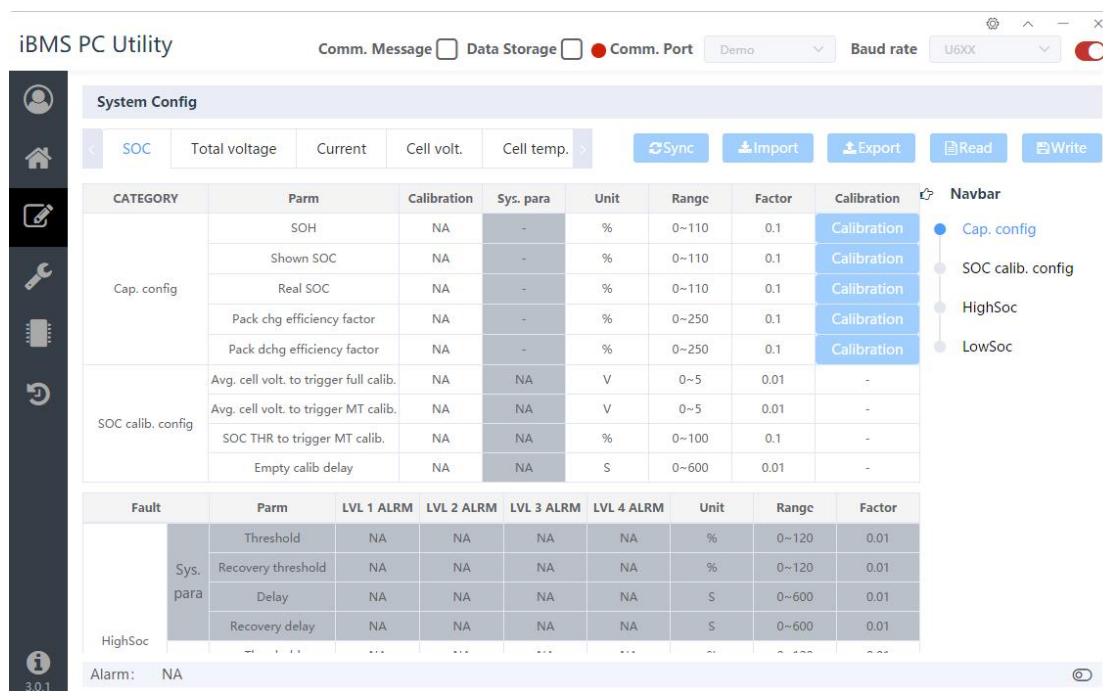
Hall index	Current	Monitor point voltage	Zeroing values within the range of	Zero-current calib.
Hall1	short circuit	0.000V	1.0A	0.0A

Alarm: No Fault

Notes:

- The BMS information interface displays the data collection of each hardware pin end of the BMS.
- The functions displayed in this interface are compatible with all BMS systems, and some BMS systems only have some of them.
- This interface includes the status of high side switches, high voltage monitoring points, current collection points, and other collection points.

5.4 System Configuration



Notes:

- The system interface can modify and configure parameters such as SOC, voltage, current, temperature, etc.
- There are two ways to modify types:
 1. Calibration type parameter: There is a "calibration button" after this type of parameter, and there is no system parameter. After filling in the numerical value in the "calibration value" field, click "calibration" to write the parameters into the system.
 2. System type parameters: These parameters are generally bound to BMS firmware, and can be effectively run by modifying these parameters on the upper computer, but the system parameters in the firmware cannot be modified. The modification method is as follows:

a. Sync: Read system parameters from firmware.

- b. Read: Read the parameters running in the current system.
- c. Write: Write the modified parameters into the system.
- d. Export: Read the parameters running in the current system and generate a record document.
- e. Import: Upload a document and write the parameters in the document into the running parameters in the system.

5.5 Parameter calibration&forced control

iBMS PC Utility Comm. Message ☐ Data Storage ☐ **Comm. Port** ☒ USBCAN2 Baud rate 250K

Parameter Calibration & Force Control Proj. No.:D066.000.007.01 (B705)

Elec. lock state

Elec. lock driving state	Unlocked	Elec. lock actual state	Unlocked	Elec. lock force control	<input type="button" value="Open"/>	<input type="button" value="Close"/>
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Hlss state

Device / number	State	Feedback current	Feedback voltage	Force control		
BCU	HSS1	Open	0.000A	0.011V	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS2	Open	0.000A	0.011V	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS3	Open	0.000A	0.022V	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS4	Open	0.000A	0.022V	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS5	Open	0.000A	0.000V	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS6	Open	0.000A	0.000V	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS7	Open	0.000A	Invalid	<input type="button" value="Open"/>	<input type="button" value="Close"/>
	HSS8	Open	0.000A	Invalid	<input type="button" value="Open"/>	<input type="button" value="Close"/>

System config

Alarm: No Fault

3.0.2

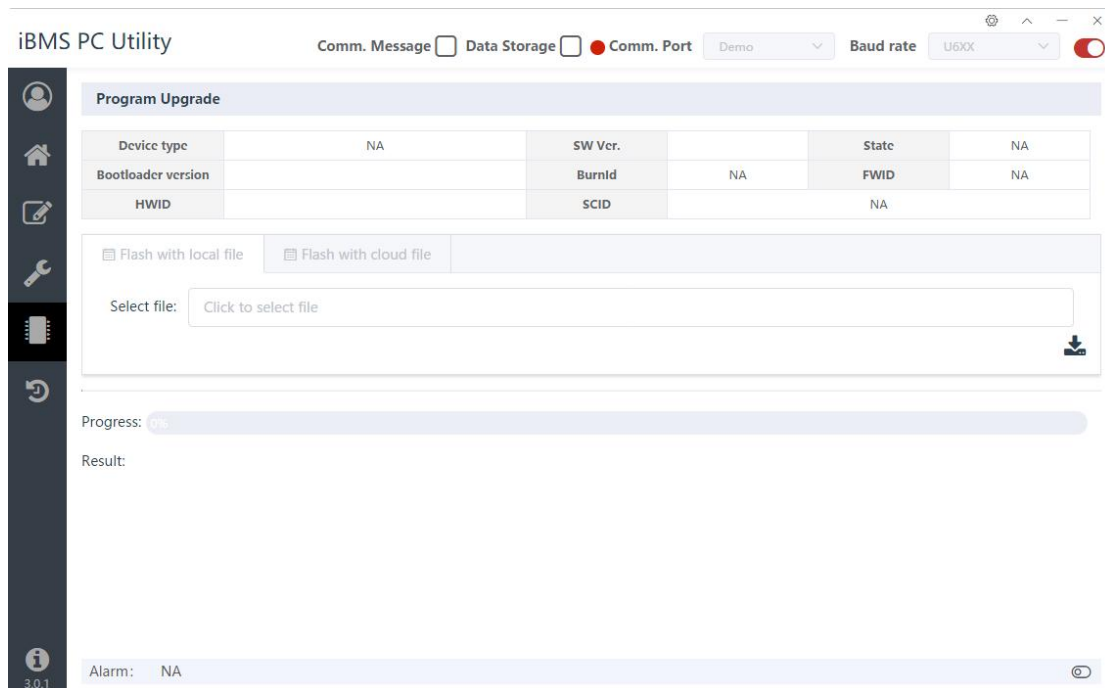
Notes:

- Electronic lock strong control: Only effective for BMS with electronic lock function, it can close and disconnect the electronic lock.
- High/low edge strong control: It can control the opening and closing of corresponding relays.
- System configuration: It can simulate parameters and assist in on-site testing and

verification.

5.6 Firmware upgrade

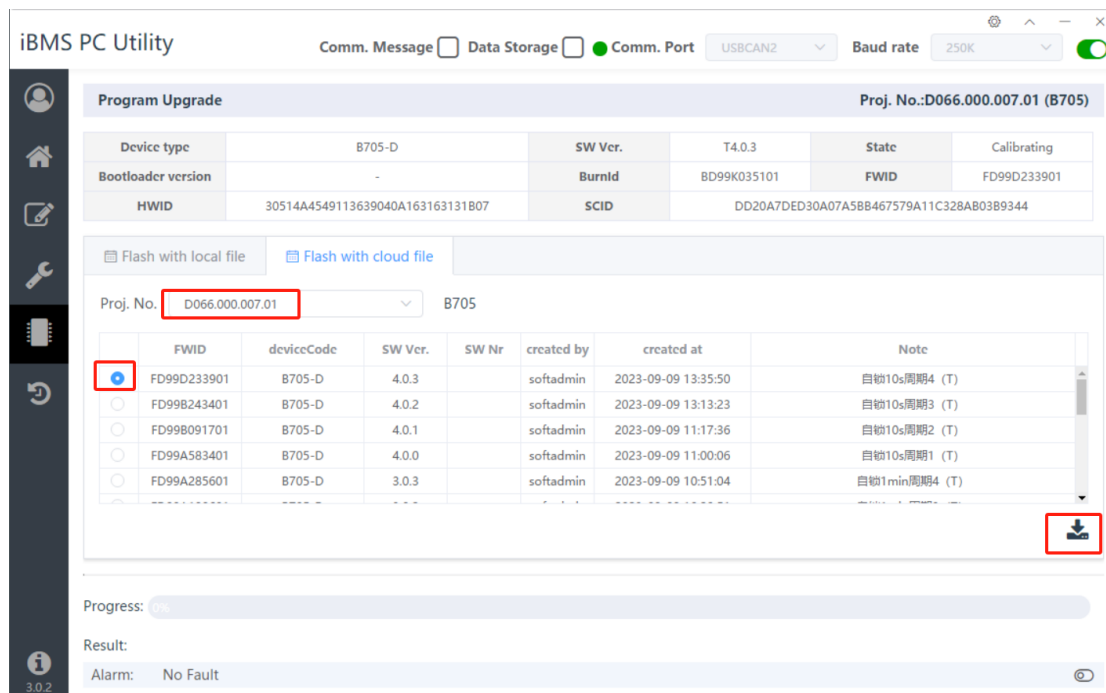
Local upgrade



Notes:

- When upgrading, the BMS needs to be in a powered on operation state, and the circuit cannot have a charging and discharging current exceeding 3A.
- Click on the "Click to select files" section and select the files that need to be upgraded in the pop-up window.
- Click on the download button on the right to start upgrading the program.
- Observe the burning progress and status below, and wait for the upgrade to complete.

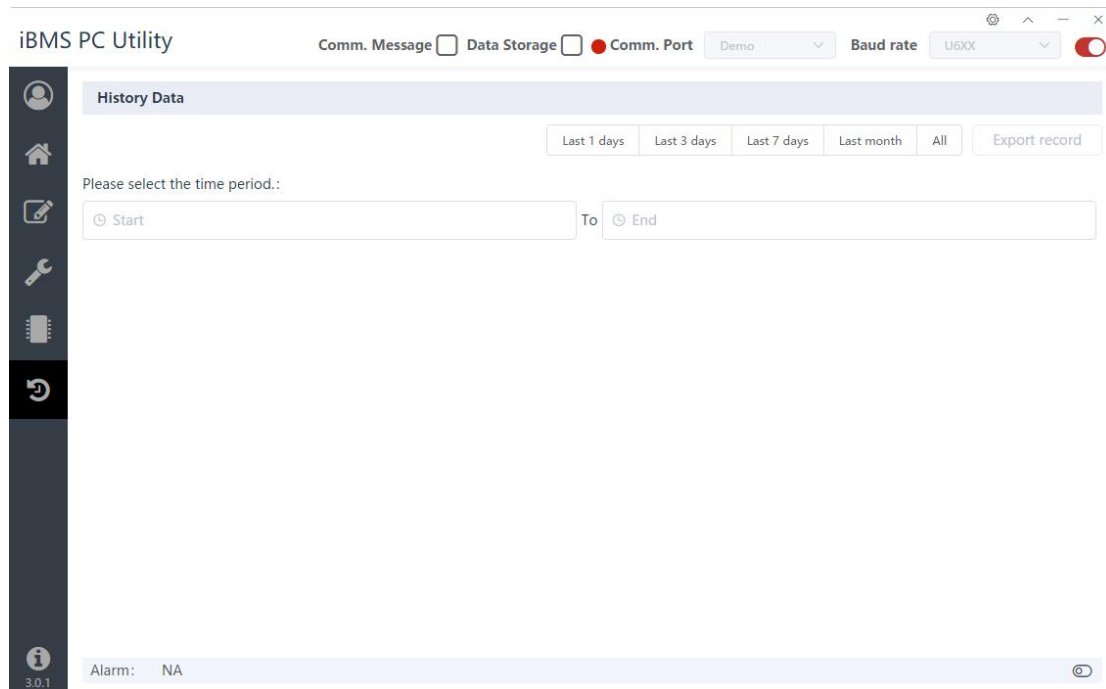
Online upgrade



Notes:

- When upgrading, the BMS needs to be in a powered on operation state, and the circuit cannot have a charging and discharging current exceeding 3A.
- Click on the "Project Number" and select the project number from the drop-down list to view the firmware under the corresponding project.
- Select the required firmware and check it.
- Click on the download button on the right to start upgrading the program.
- Observe the burning progress and status below, and wait for the upgrade to complete.

5.7 Historical Data



Notes:

- The historical data interface can export the latest month's data (related to the amount of stored data, the larger the amount of data, the shorter the time. For example, the duration of storing 120 battery data strings is less than one tenth of 12 battery data strings).
- You can choose the time period for exporting historical data, choose a fixed time, or freely set the time period.
- When exporting data, it is necessary to maintain BMS power supply and the circuit must not have a current exceeding 3A.
- The more data exported, the longer it takes, possibly up to 16 hours. It is recommended to consider time selection when exporting data.

6 P700 BMS Upper Utility software UI

6.1 Software top features

Communication message: If checked, messages during the communication process can be recorded;

Real time storage: After checking, an Excel file can be created in the directory where the upper computer is located and the folder can be automatically opened. The system status interface data can be saved in real time every 2 seconds;


Communication port:

The dot on the left is displayed in red when there is no communication on the upper computer, and in green when communication is normal.

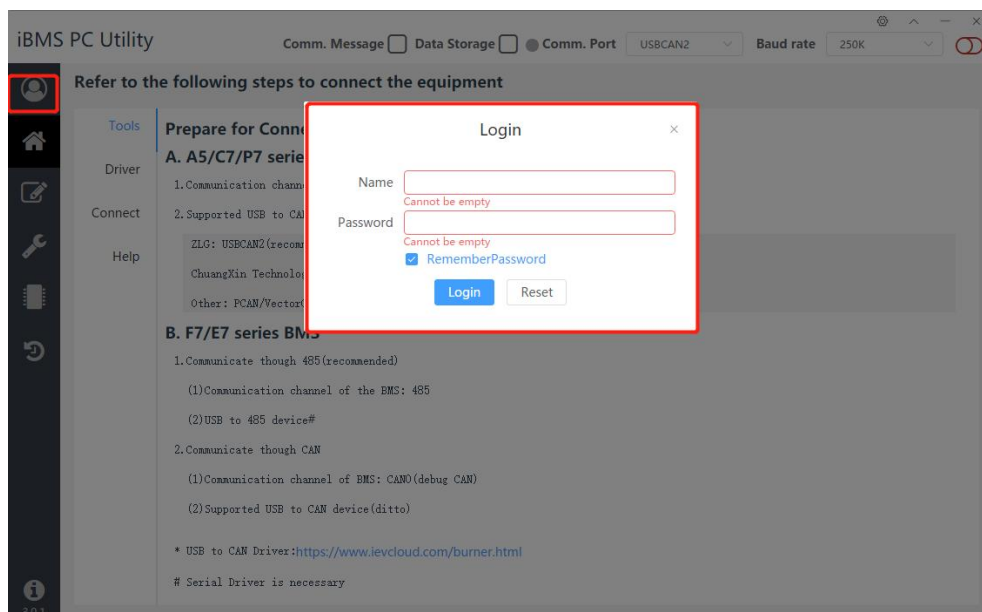
The drop-down box on the right allows you to select different USBCAN and 485 device ports.

Only when the selected device port is consistent with the actual one used can communication be normal;

Baud rate: If using a CAN device, the baud rate is 250K. If using a 485 device, the baud rate is 9600;

Start button  : After the above configuration is completed, click this button to enable communication between the upper computer and BMS.

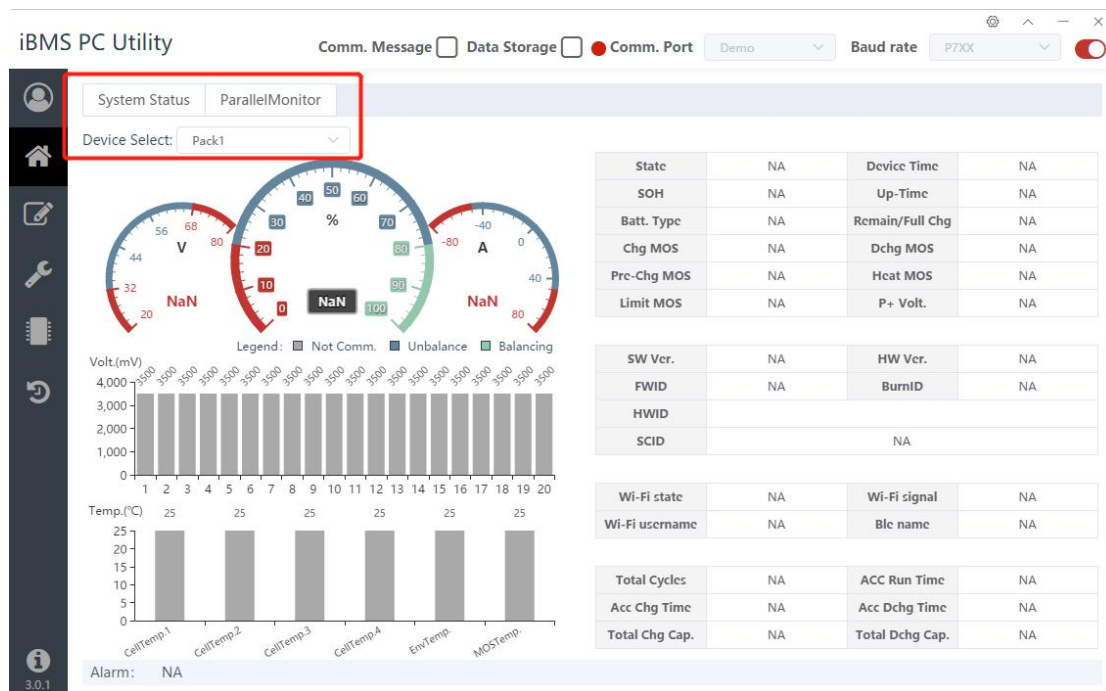
6.2 Login interface



Notes:

- When not logged in to the account, can only view the interface and export data, and cannot modify system configuration;
- After logging in to the account, you can use all the functions of the upper computer: viewing system status, configuring system parameters, upgrading firmware, exporting data, and so on.
- Offline login: For the convenience of working in some areas without a network, the upper computer supports offline login. After logging in with a network, the upper computer will remain logged in and can perform related operations even when entering the area without a network.

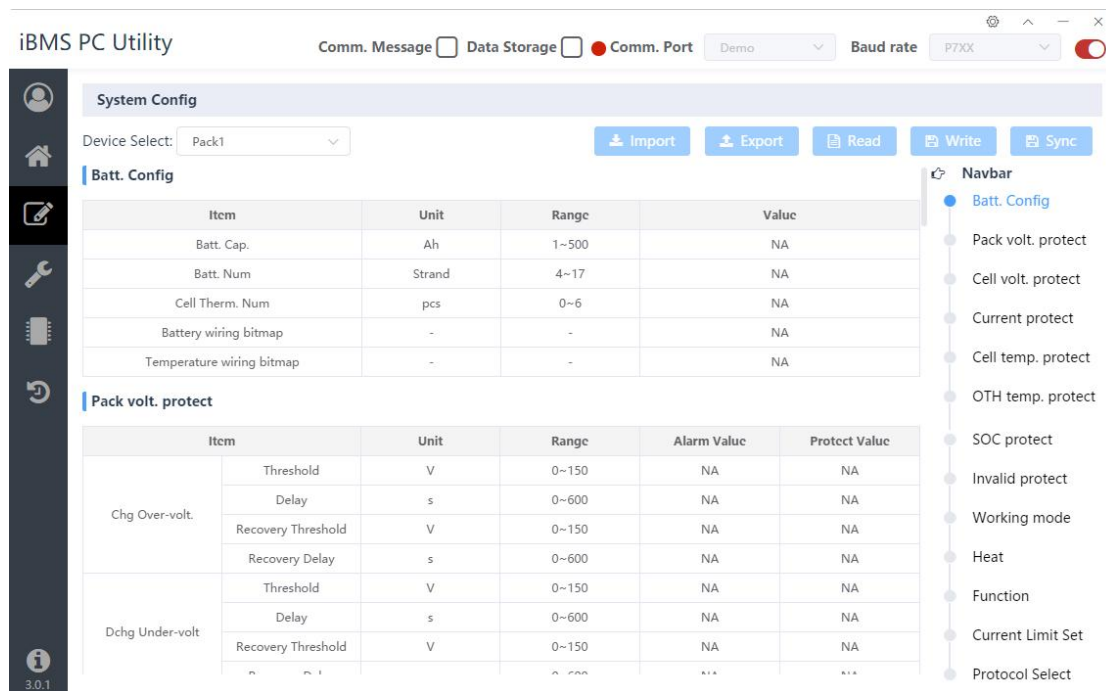
6.3 System Interface



Notes:

- The main interface displays the overall information of battery voltage, current, SOC, etc;
- The main interface displays the voltage of each string of cells and the temperature of all temperature sensors;
- Display the working status of BMS;
- Display network configuration information of BMS;
- Display the cumulative information of battery charging and discharging.
- Parallel information: When multiple P700 are connected in parallel, the host will read the slave information and display it in the parallel information.
- Device selection: When multiple P700 devices are connected in parallel, the system status information of different P700 devices can be viewed by switching and selecting.

6.4 System Configuration

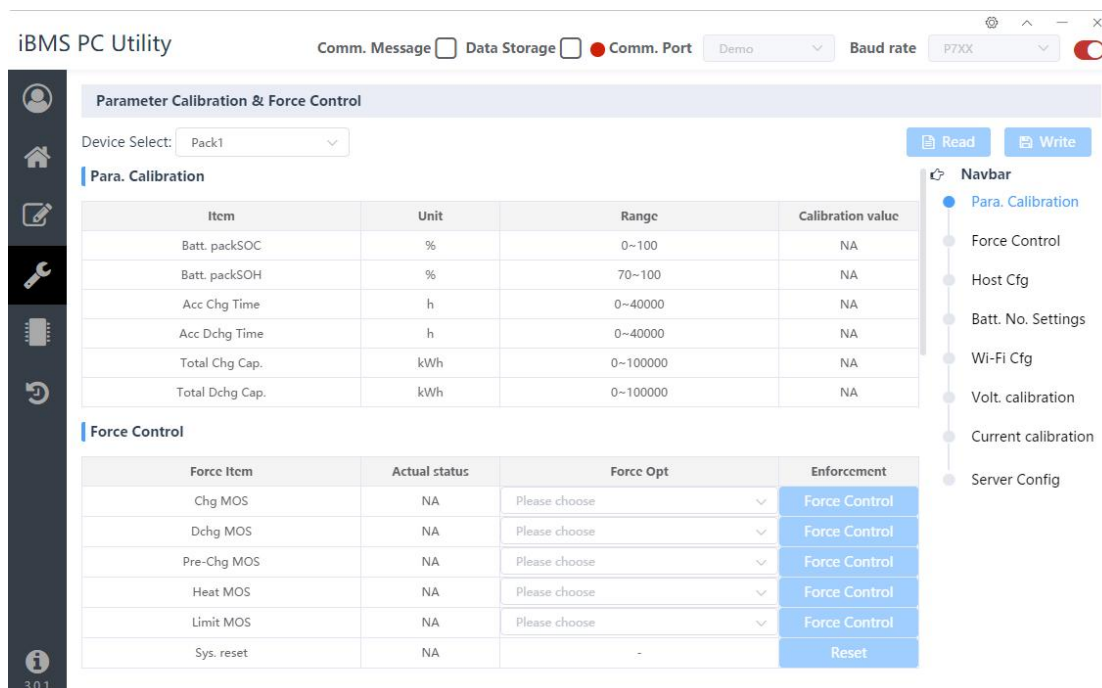


Notes:

- Changes to some parameters will be accompanied by changes to other related parameters. For example, when changing the number of battery strings, the upper computer will automatically calculate the corresponding total voltage overvoltage threshold;
- The threshold can be changed in batches, but all must be within the range limit;
- When changing the threshold, pay attention to the unit.
- Modification steps:
 - a. Click Read.
 - b. Modify parameters (or import parameters).
 - c. Click Write.
 - d. Prompt for successful writing.
- If multiple P700 are in parallel, different PACKs can be switched to configure different BMS parameters.

- After selecting the inverter protocol, it is necessary to restart the BMS;

6.5 Parameter Calibration&Forced Control



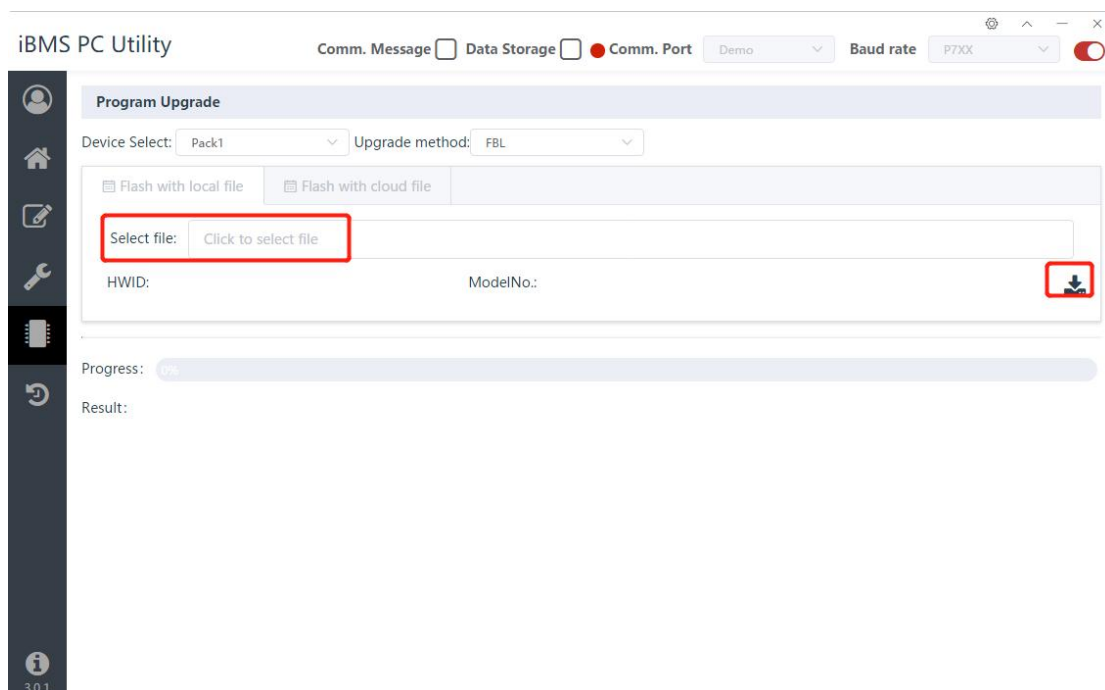
Notes:

- When switching the working mode, the upper Utility software actively stops communicating with the MOSFET BMS, and the data is no longer updated;
- When successfully switching to other working modes, if you need to use the upper Utility to wake up BMS, please restart the communication switch button.
- When forcibly controlling MOS, it is necessary to set the control time, otherwise strong control cannot be carried out.
- System reset means restarting the BMS. It is recommended to operate when there is no current in the circuit (when the system is idle).
- Test mode cannot be automatically turned off after being turned on, so after testing, you need to click switch again to turn off the test mode.

- Other parameters do not need to be modified when there is no demand, just keep them as they are.
- Voltage and current calibration: This function is mainly used for the calibration of BMS individual voltage/current collection, just keep it as it is.
- WiFi configuration/server configuration: Just keep them as they are.

6.6 Firmware upgrade

Local upgrade

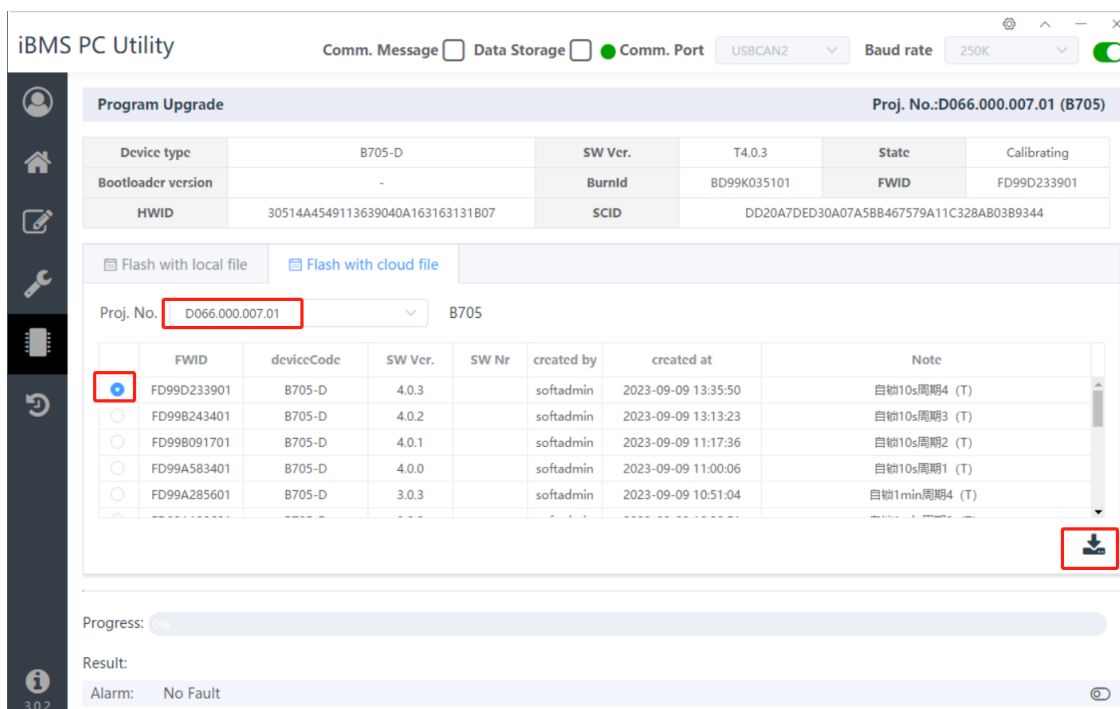


Notes:

- When upgrading, the BMS needs to be in a powered on operation state, and the circuit cannot have a charging and discharging current exceeding 3A.
- Click on the "Please click to select files" section and select the files that need to be upgraded in the pop-up window.

- Click on the download button on the right to start upgrading the program.
- Observe the burning progress and status below, and wait for the upgrade to complete.
- If there are multiple P700 in parallel, you can choose the device list "pack" to upgrade different devices. But the upper computer cannot upgrade all devices simultaneously
- Upgrade method:
 - a. FBL upgrade: During the upgrade, the BMS will stop all work until after the upgrade, the BMS will automatically restart and update the program.
 - b. OTA upgrade: During the upgrade, the BMS can still work. After the download is completed, the BMS will not automatically restart. It is necessary to restart the device before updating the program. This upgrade will take longer.

Online upgrade

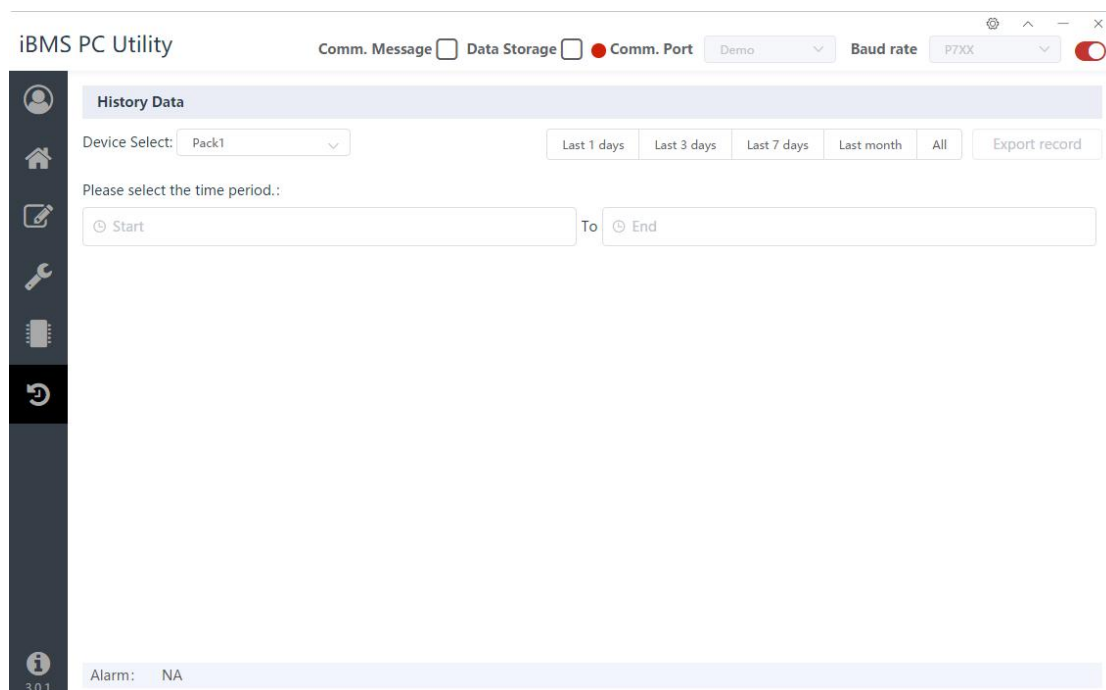


Notes:

- When upgrading, the BMS needs to be in a powered on operation state, and the circuit cannot have a charging and discharging current exceeding 3A.
- Click on the "Project Number" and select the project number from the drop-down list to view the firmware under the corresponding project.
- Select the required firmware and check it.
- Click on the download button on the right to start upgrading the program.
- Observe the burning progress and status below, and wait for the upgrade to complete.
- If there are multiple P700 in parallel, you can choose the device list "pack" to upgrade different devices. But the upper computer cannot upgrade all devices simultaneously
- Upgrade method:
 - a. FBL upgrade: During the upgrade, the BMS will stop all work until after the upgrade, the BMS will automatically restart and update the program.
 - b. OTA upgrade: During the upgrade, the BMS can still work. After the download is

completed, the BMS will not automatically restart, and a manual device restart is required to update the program. This upgrade will take longer.

6.7 Historical data



Notes:

- The historical data interface can export the latest month's data (related to the amount of stored data, the larger the amount of data, the shorter the time. For example, the duration of storing 120 battery data strings is less than one tenth of 12 battery data strings).
- You can choose the time period for exporting historical data, choose a fixed time, or

freely set the time period.

- When exporting data, it is necessary to maintain BMS power supply and the circuit must not have a current exceeding 3A.
- The more data exported, the longer it takes, possibly up to 16 hours. It is recommended to consider time selection when exporting data.
- If there are multiple P700 in parallel, different devices can be exported as corresponding device lists.