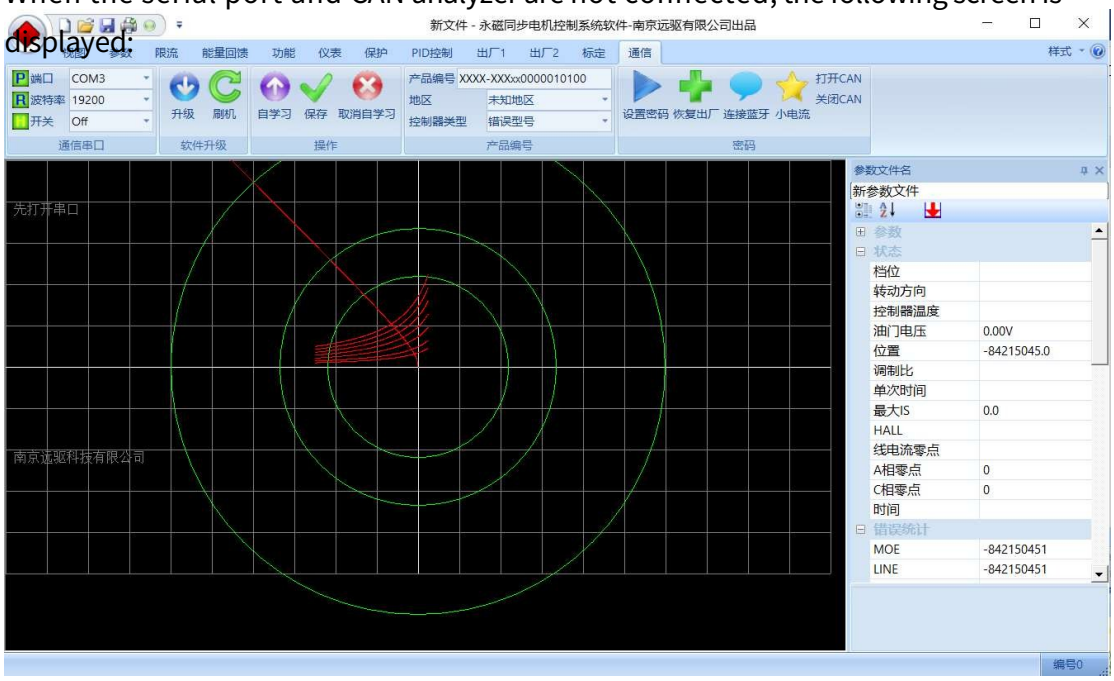
Parameter description of the Far Drive Technology controller

2023 09 19

1 PC upper computer software interface:

When the serial port and CAN analyzer are not connected, the following screen is displayed:

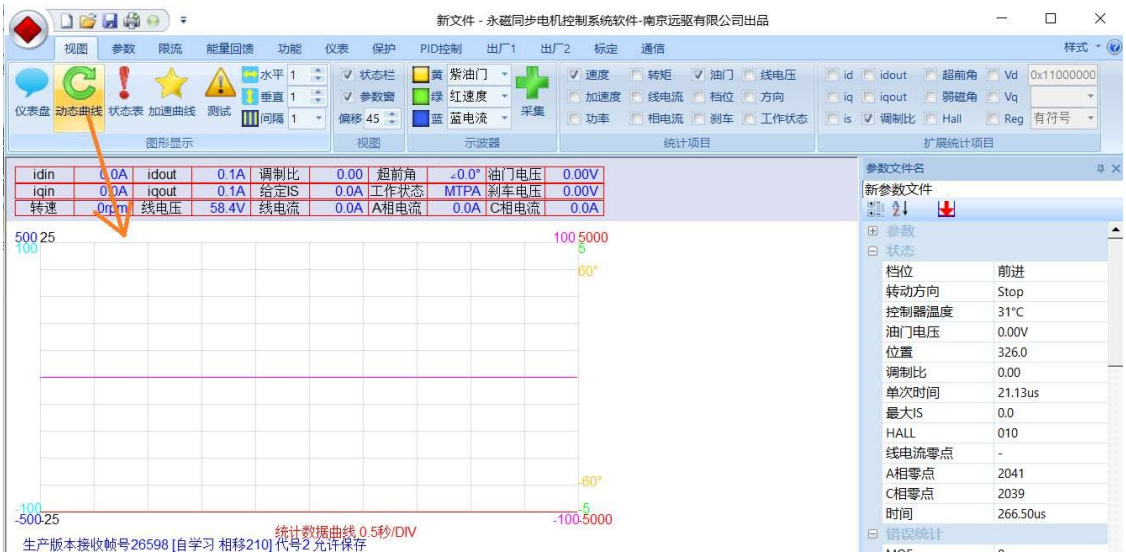


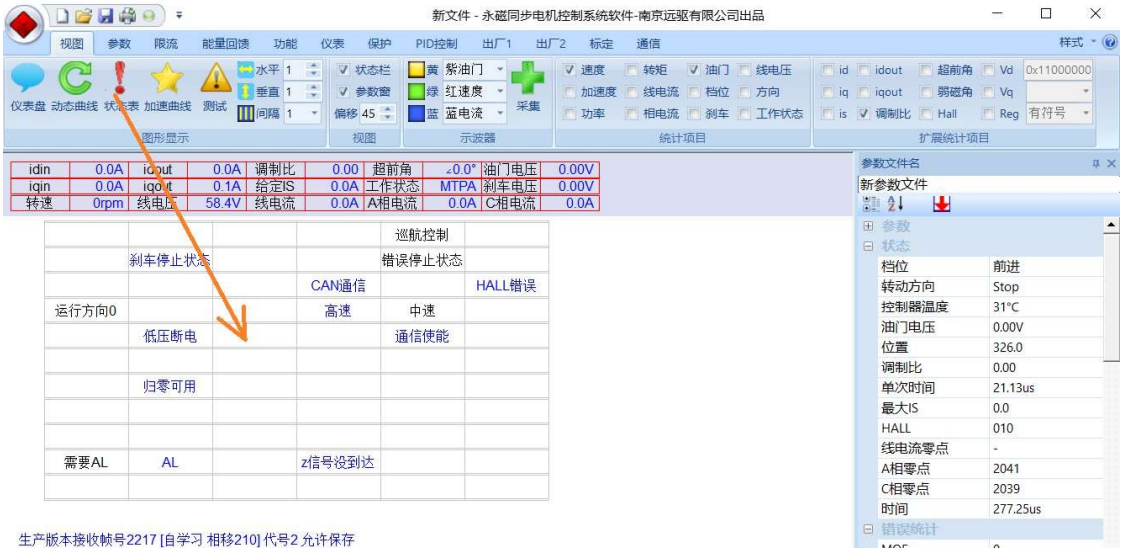
When you connect the serial port or turn on CAN, the following screen is displayed:

Once connected to the controller, the data is uploaded from the controller to the host computer page:

The view contains a dashboard page to dynamically view the working parameters, a statistics page to view the dynamic characteristics of the controller work in real time, a status table to view the controller work status in real time, you can also click "Collect" to view the 2048 groups of samples after the first refueling door of the running data, without turning off the power, it has been saved in the controller. For example, 0.1 second sampling

For one set of data, the controller can record 205 seconds of data to analyze the vehicle's driving characteristics.





2 parameters

2.1 Basic motor parameters

2.1.1 Position sensor, the controller is divided into 4 types of hardware depending on the position sensor:

1) **Hall Edition**
2) **Incremental encoder version**
3) **Differential encoder version**
4) **Absolute encoder version**
5) **Rotary encoder version.**

serial number	options (as in computer software settings)	Controller Hardware	Extended Code	releases
0	120° Hall	Hall Version Controller		**H,R,I**
1	Conventional incremental encoders	**Encoder Version Controller**		**H,R,I**

2	Conventional incremental encoder 4096	**Encoder Version Controller**		**H,R,I**
3	Conventional incremental encoder 8192	**Encoder Version Controller**		**H,R,I**
4	Differential Encoder 2048	**Differential Encoder Controller**	**Internal J,External Q**	**H,R,I**
5	Differential Encoder 4096	**Differential Encoder Controller**	**Internal J,External Q**	**H,R,I**
6	Differential Encoder 8192	**Differential Encoder Controller**	**Internal J,External Q**	**H,R,I**
7	Differential Encoder 16384	**Differential Encoder Controller**	**Internal J,External Q**	**H,R,I**
8-12				
13	Absolute encoders 13	**Absolute encoder control tool**	**Built-in H, External P**	**H,R,I**
14	Absolute encoders 14	**Absolute encoder control tool**	**Built-in H, External P**	**H,R,I**
15	**reservations**			
16	**60° Hall**	Hall Version Controller		**H,R,I**
2-15	**2-15 Corresponding rotationally variable pair of poles**	**Rotary Controller**		**X,U**

Modify the software, powders have to be effective. optional built-in and above version support. Older versions are not optional.

hardware version	clarification
7	Controller version from some years ago, single function, relatively solidified
C	Earlier versions of the controller, single-function and relatively solidified
A	New version, support some parameter settings, single function, relatively solidified
B	New version, support some parameter settings, single function, relatively solidified
H	Newest, universal, 30P, rich parameters
L	Newest, universal, dual-band, 30P, rich parameters
R	Latest, national standard, dual-band, 6-pole + 8-pole + 16-pole socket, rich in parameters
Q	Newest, national standard, 6-pole+8-pole+16-pole socket, rich parameters
I	Newest, isolated, 30P, rich parameters
J	Newest, isolated, dual-band, 30P, rich parameters
X	Newest, rotary change, 30P, rich parameters
U	Newest, isolated rotary, 30P, rich parameters
M	2024 New version, general purpose, 30P, rich in parameters.
N	2024 new version, universal, dual band, 30P, rich parameters

There are many kinds of software programs, so I won't give you any more examples: special codes can be seen 🐶 whether they are special programs or not:

nicknames	hidden meaning
0~7	Hall Vector Starting Velocity
+8	8x PID
+16	deep weak magnetic field program
+32	Brake Inspection
+64	Old controller

+128	No Bluetooth RS485 communication program
+256	Customized programs for Series 8
+512	Customized programs for series 12
+1024	Customized programs for series 16
+2048	Isolated version of the program
+4096	120M high speed version of the program

There are also a variety of specific programs for special user requirements, which are not reflected in the code.

Controller function code:

nicknames	hidden meaning
'h'	Deluxe Edition
's'	track version
'X'	'X' charge protection signal is inverted, non-'X' charge protection is active low.
'V'	36V default for GB vehicles, 48V default for other GBs.

2.1.2 Temperature Sensor:

options (as in computer software settings)	Hxx Version	old version
not have	√	√
PTC-1000	√	√
NTC-230K	√	√
KTY84-130	√	Program fixing KTY84-130/KTY83-122
theoretical	√	√
KTY83-122	√	×
NTC-10K	√	×
NTC-100K	√	×

2.1.3 Phase Shift.

The angular position of the motor is a key characteristic, which is usually indicated by the motor manufacturer. Most of the hub motors on the market are 30°, 210° and 90°, but there are some special motors. Note that the motor factory labeling method is different from the far drive logo, if you are not sure about the angle, you can find this value through self-learning methods. Generally, the error of phase shift between two operations is not more than 2°, which proves that there is no problem in the operation method and the phase shift is not a problem.

2.1.3.1 Passed 11.3 Upper computer initiated self-learning.

By clicking on the upper unit self-learning button, 2 short and one long sound will be heard inside the controller to indicate that self-learning has been initiated. In addition, when you click on the upper computer to cancel the self-learning button, the sound disappears, i.e., the self-learning is canceled.

2.1.3.2 A method of initiating phase-shift self-learning by squeezing the brakes only, without a computer:

This method is applicable to all controllers with the brake line function installed, ND series with software version 783 or higher, CN series, BN series controllers. A01 Above versions require that the power be turned on by pinching the turnbuckle before starting the machine, do not let go and do the following. 1: Keep the brake connected, the controller is off and the

motor is stationary.

2: Turn the handle to the end, boot, this time the controller alarm, the motor does not turn.

3: Enter self-study, Morse code 8 bits: 11000000.

1="Long squeeze brake 0.5 sec~2 sec", 0="Short squeeze brake less than 0.5 sec"

When you hear 2 short and 1 long, you are in self-learning mode. If you don't hear it, consider that you have made a mistake and try to re-enter the Morse code.

2.1.3.3 Self-learning process:

After entering the self-learning state, with the wheels overhead and the turnbuckle in the bottom, the motor should turn at this time, if it doesn't, the hall wires may have been swapped, or the motor wires may have been swapped. At this time just need to exchange the big blue and green wires, it is
It can be turned up.

After turning up the speed will be close to the motor fixed speed, then it will automatically adjust the phase shift to fit the motor, followed by the motor will be reversed and fit the motor, after the automatic completion, the motor stops. You can release the throttle. Finish the self-learning.

Self-learning good motors will remain quiet.

2.1.3.4 Morse code changes the direction of the motor:

After the self-learning is completed, if you find that the normal startup motor is reversed, then you can modify the motor direction through the host computer, you can also change the motor direction through the Morse code: Morse code 8 bits: 11110000. if you find that the motor is reversed after the motor self-learning, you can correct the direction of the motor through this instruction.

2.1.3.5 Morse code to change the speed limit:

The Morse code can be changed through the host computer to set 6 digits to release the speed, no restriction when 000000, restriction when any other code: it is necessary to operate the Morse code every time the power is turned on in order to release the speed limit.

Setting the 7-digit Morse code is the speed limit, which also operates on the last 6 digits, and the speed limit is converted once: if it was a speed limit state, it becomes a non-limit state, and vice versa. This conversion is saved in the controller, and it will be switched to this state when the controller is turned on in the future.

2.1.4 **Pole Pair Number: Default 4 for Hall motors No need to change. The pole pair setting for encoder motors must be accurate otherwise it is not Can rotate. Selectable values =** 3, 4, 5, 6, 7, 8, 10, 12, 14, 16~30, Encoder: 3-8 pairs of poles display the actual rotation speed, above 10 pairs of poles display the rotation speed according to 4 pairs of poles. To modify the number of pole pairs, you have to save the points to make it effective.

2.1.5 **Motor direction.**

Specifies the motor direction when advancing 0: motor right setting, 1: motor left setting. Effective only after reset is saved.

2.1.6 **Rated Speed:** The speed of the motor at the rated voltage, referred to as the rated speed, is often referred to as the constant speed in the electric motorcycle industry. This fixed speed determines the highest motor speed. Generally speaking, a common controller can drive the motor to the maximum speed near the fixed speed under the rated voltage. The controller will recognize the rated speed at the current voltage during self-learning.

2.1.7 **Rated Voltage:**

The maximum number of strings of batteries for the NJ Far Drive Controller for different as follows:

	lead-acid battery	Ternary lithium battery	lithium iron phosphate battery
48V	4 strings	13-14 strings	16 strings
60V	5 strings	17	20 strings
72V	6 strings	21 String	24 strings
75V	6 strings	22 String	25 strings
84V	7 strings	24 strings	28 string
96V	8 strings	28 string	32 strings
108V	9	32 strings	35-36 Strings

🎧Factory Settings 72 Series=72V,75 Series=75V,84 Series=84V,96 Series=96V,108 Series=108V

Note that the rated voltage affects the power display, the setting can not be higher than 🎧factory voltage, after setting the parameters, you have to tap save again, valid after reset.

2.1.8 **Rated power: The rated** power of the motor, please set it according to the actual condition of the motor.

2.1.9 **Maximum Speed: Limits the maximum motor speed.**

1) In the EV market, the maximum speed is usually not limited, but the maximum speed is limited by the current limiting parameter at the back. After the speed exceeds the fixed speed, it automatically enters the weak magnetization state. The more the speed exceeds the fixed speed, the greater the depth of weak magnetization.

2） Depth of weak magnetization: (Maximum speed - Fixed speed) / Fixed speed *100%. Generally, hub motors can be weakly magnetized up to 50%.

Some hub motors can have a weak magnetic depth of more than 100%. Therefore, we stipulate that the weak magnetic depth of surface-mounted motors should not exceed 50%, while the weak magnetic depth of embedded motors should not exceed 150%.

2.1.10 Maximum phase current:

Maximum value of phase line current of the operating motor. Determines the motor output 🐶 maximum torque at standstill to rated speed.

The maximum phase current has a maximum limit on the controller hardware, and the set value is not allowed to exceed 🐶🐶 factory setting. Failure to do so will result in a much higher probability of the controller burning out.

Different types of motors will exhibit different output 🐶 torque for the same maximum phase current setting. The torque version of the motor has a high output 🐶 torque, the balanced version has a slightly lower output 🐶 torque, and the speed version of the motor has the smallest output 🐶 torque. The motor with low fixed speed has a high loss 🐶 torque and the motor with high fixed speed has a low loss 🐶 torque.

2.1.11 Maximum line current:

Controller operating battery bus current max. Determines the motor input 🐶 maximum power value. Controller max input power = battery voltage * max line current.

This current is limited to the maximum customer line current. This value determines the maximum output power and thus the maximum speed.

2.1.12 Back up the RPM:

Maximum RPM for backward gearing.

2.1.13 Swap phase wires:

Default 0, 1 if the blue and green wires have been exchanged. note that this parameter is not correct and will cause the motor not to rotate. This parameter is valid after reset, Hxx version self-learning will modify this parameter automatically.

2.1.14 Weak magnetic properties:

General fast, high speed jitter big change to medium, generally do not use slow, easy to overcurrent

2.1.15 Weak magnetic response:

0~6, none means no weak magnetization. Default weak m

Speed Expansion: Pushing the motor speed to a higher speed t d is called speed expansion.

Speed expansion method 1: Increase the working voltage, the higher the voltage, the higher the motor speed. Speed expansion method 2: Do not increase the working voltage, through the weak magnetization, increase the speed of the motor.

Without changing the battery voltage, the motor speed is increased directly by controlling the current limiting parameter.

2.2 Acceleration and deceleration characteristics

2.2.1 Accelerated sensitivity:

Acceleration speed,8~224, the higher the number, the faster the throttle response.

An electric car is usually a gas pedal, while an electric motorcycle is a gas turn knob or center control.

While an electric car should have a moderate response to the gas pedal, the requirements of an electric motorcycle are different; some customers require it to be light, slow, and steady, while others require it to be responsive and ready at the touch of a button.

Acceleration sensitivity refers to how fast or slow the throttle response is. This parameter ranges from 16 to 224. The larger the number, the more sensitive the throttle acceleration.

16 is already slow, and a setting of 32 is generally appropriate for electric vehicles, rarely exceeding 64.

For electric motorcycle, besides setting at 32, many users prefer fast response, so setting at 64, 128. track race even set at 224.

2.2.2 Deceleration sensitivity:

Deceleration speed: 16~224, the higher the number the shorter the return throttle lag.

2.2.3 Motor position:

Non-set value, display of motor angle

2.2.4 Back on the gas:

Default 0

2.2.5 Throttle Response:

There are three configurations of turnbuckle characteristics for different user preferences: linear, sport, and economy.

2.2.6 Economic acceleration parameters.

Default 8

2.3 Throttle Threshold

Turnbuckles on the market are uneven, and the voltage value will vary from turnbuckle to turnbuckle or gas pedal to gas pedal.

	idle voltage	voltages
Electric Motorcycle Turnbuckles	0.8V-0.9V	4.1-4.3V
center turnbuckle	0.8V-0.9V	4.5-4.95V
12V Gas pedal	0.0V-0.2V	4.6-4.8V

2.3.1 Low Threshold.

We set the low throttle threshold based on the idle voltage. Considering the fluctuation of the turnbuckle voltage, setting the low throttle threshold should be generally 0.2-0.3V higher than the idle voltage to ensure that the motor is working in the idle state when stopping.

For example, the low throttle threshold for an electric motorcycle turnbuckle would be set to 1.1V, while the low throttle threshold for a 12V gas pedal would be set to 0.5V.

2.3.2 High Threshold.

We set the high throttle threshold based on the full bar voltage. In order for the controller to be able to deliver 🎧 full power at full bar, we need to make the setting lower than the full handle voltage. But you have to be careful not to set it too low here. In order to automatically detect whether the electronic throttle is damaged or not, we set a value 0.6V higher than the high throttle threshold as the alarm limit, once exceeded, it is considered that the turnbuckle is damaged, and the controller immediately stops the power transmission 🎧 to avoid the vehicle from flying, to avoid causing a flying safety accident.

So when we set a high throttle threshold, for example, 4 .1-4.3V for an electric motorcycle turnbuckle full handle, we would set the

3.9V as the high throttle threshold. For a 12V gas pedal we would set the high throttle threshold at 4.3V.

The 742 and above versions add a throttle self-learning function. When turning to the bottom during self-learning, the controller automatically recognizes the maximum voltage of the throttle signal from the turnbuckle/pedal and generates a throttle high threshold based on this voltage.

2.4 Product Model

2.4.1 Date.

2.4.2 Duration.

2.4.3 Model: Controller Model

3 current limit

3.1 Motor current limiting protection factor:

Conversion of 500RPM,1000RPM,.....8500RPM,9000RPM in current limiting.
These RPMs are the RPMs for the number of pairs of poles calibrated inside the parameter. The corresponding parameter is also the parameter at that speed. For motors with an actual number of pole pairs greater than or equal to 16, a conversion is required.
Typical hub motors have 16, 20, 24, 28, 30 pole pairs.
A typical mid-mount motor has 3, 4, 5, 7, 8, 14 pole pairs.

If the number of pole pairs = 4 in the parameter, the motor speed = the speed on the host computer * 4 / the actual number of pole pairs of the motor. For example, if the pole pair number of the hub motor is 16
in that case
The actual speed of a 16-pole hub motor at 500RPM is 125RPM.
The actual speed of a 16-pole hub motor for 1000RPM is 250RPM

The actual speed of a 4000RPM 16-pole hub motor is 1000RPM.
The actual speed of a 16-pole hub motor at 5000RPM is 1250RPM.
The actual speed of a 16-pole hub motor at 5500RPM is 1375RPM.
The actual speed of a 6000RPM 16-pole hub motor is 1500RPM.
The actual speed of a 16-pole hub motor at 6500RPM is 1625RPM.
The actual speed of a 16-pole hub motor at 8000RPM is 2000RPM.

Weak magnetism limitation: gradual increase of current limiting parameters

The current limiting value is set from a safe value, gradually increasing the speed, making sure that the weak magnetism cannot be excessive. Once the idling speed is found to be unstable or even 🎧 line MOE or OVER protection, it indicates that the speed is too high, the weak magnetism is excessive, and the parameters should be changed back.

The current limit value we set should be considered according to the actual demand. For a motor with a fixed speed of 1000RPM, the depth of weak magnetization is considered to be 50%. The maximum speed is also considered to be 1500RPM, and it is hoped that the motor will not operate above 1625RPM. Therefore, the current limit value is set at 30% for 6000RPM and 6500RPM and above.

Less than 5%.

This ensures that the motor is only 50% weakly magnetized when idling. This ensures that the motor is only 50% weak when idling, and that it will not be too weakly magnetized, causing the motor to jitter or even burn out.

In many motors, the depth of weak magnetization can reach 100%, and 1000RPM motors can operate at high speeds of 2000RPM. For this type of motor, the current limiting factor can be expanded in order to maximize performance. The current limiting parameter can be set above the normal value of 70 for 8000RPM, 30 for 8500, and below 5 for 9000RPM.

3.2 Speed Control Rating:

Speed Control Levels: Default 4 levels: BOOST, HIGH, MEDIUM, LOW.

1) BOOST file: Bst is displayed on the mobile APP/computer, it is valid when the BOOST function is on and the BOOST time is set by the
4.3 Parameter control, BOOST operates at 🎧 factory customer maximum line current, maximum phase current, and current limiting factor limits.
2) HIGH SPEED: Displayed on mobile APP/computer D. High speed is subject to maximum line current, maximum phase current, current limiting factor and maximum speed limiting conditions.
3) Medium speed: The DM is displayed on the mobile APP/computer. medium speed is limited by the medium speed line current ratio, medium speed phase current ratio, and by the medium speed RPM.
4) LOW SPEED: DL is displayed on the mobile APP/computer. low speed is limited by low-speed line current ratio, low-speed phase current ratio, and by low-speed RPM.

3.2.1 Low-speed gear parameters

Low-speed line current scaling, low-speed phase current scal eds

3.2.2 Parameters of medium-speed gear

Medium-speed line current scaling, medium-speed phase cur m-speed speeds

3.2.3 LDVOL

200-900, default 900.

Matching of idling noise in the high-speed section and balanc nd power saving at the highest speed.

3.2.4 LQVOL

1) Intermediate Throttle Voltage (mV, VQH+4 Intermediate Throttle Enable, 0~4000)
2) Limitingcurrent,(0 to 4000 in 1/4A)

3.2.5 FAIF:

0~513	0	Starting Resonance Characteristic Matching Option 1

+2048	reservations	
+4096	reservations	
+8192	TCS prohibit prohibit	1 means disable TCS function, **0 enable TCS function by default.**
+16384	TCS abbr. for cubic meter style	1 for wheel speed TCS control, **0 default ABS-CAN protocol TCS control**
+32768	reservations	

3.2.6 L2, L4: reserved

3.2.7 Speed Limit RPM: The RPM used for Morse code speed limiting.

4 energy return

For the throttle back brake function, during the ride, the throttle back goes into the e-brake state.

For the e-brake function, when braking, the whole vehicle gives 🎧 brake signal to the controller, and the controller detects the brake signal and then enters the e-brake state.

Note that to use the e-brake function, you must enable this function by selecting **e-brake or return throttle brake** in the **follow** item. And set the return current. Note that the maximum return current is generally 25%~50% larger than the stop return current when setting the parameter.

4.1 Brake current limitation:

4.1.1 Stop the reflux:

Brake current for e-brake. Default 2A, change to 5A-20A as needed when you need e-brake strength, for the large capacity battery of 4-wheeler, its back-charging current is allowed to be bigger, it can be set to 20A-60A.

4.1.2 Maximum return flow:

Peak braking current of e-brake: default 4A, when you need strong braking, you can set it to 10A-40A, for 4-wheeler, you can consider 40A-80A.

4.1.3 Back to the throttle brake point:

Default 0. The faster you go back on the throttle, the lighter the braking effort. Slower the speed, lighter the brake force. 1: The brake force is maximum when you return to the throttle.

Above this RPM, the rotary handle is halfway back to a constant speed with no acceleration or deceleration. For example, 4000 means 0-
The higher the 4000 rpm speed, the closer it is to the half throttle value. Above 4000 rpm, the middle throttle value is a constant speed, not accelerating or decelerating. Turn the handle above the center value to accelerate, below the center value, decelerate, turn the handle back more, the more powerful brakes.

4.2 Negative current coefficient:

The scale factor that controls the reverse charge current is controlled at 500rpm, 1000rpm,...,9000rpm. The maximum value of the coefficient is 0 and the minimum value is -100. The closer to -100, the more negative the current.

For ordinary two-wheeled vehicles, for the controller about 400A, negative current

factor -10%~-30% is enough. Other controllers should be adjusted according to the situation. For the sake of driving safety, you can start from -10% to debug, if you think it is not enough, then change it to -15%, -20%, don't set it to -50%~-100% all of a sudden, as this kind of operation is easy to bring the danger of braking sharply.

Older versions of the controller do not come with a negative current factor.

5 functionality

5.1 Function input pin

5.1.1 BOOST: Select the BOOST function button input pin, an invalid sele e this function.

5.1.2 Cruise: select the cruise function button input foot, selection of in e this function

5.1.3 P-Phase: Select the P-Phase function button input pin, selecting will not enable this function.

5.1.4 Forward: select the forward gear function line input pin, the selec not enable this function

5.1.5 Backward: Select the input foot of the backward gear function line, invalid selection will not enable this function

5.1.6 High-speed: select the high-speed gear function line/button input pin, the selection is invalid will not enable this function

5.1.7 Low speed: select the low speed gear function line input pin, the selection is invalid will not enable this function

5.1.8 Charging: select the charging protection function line input pin, the selection is invalid will not enable this function

5.1.9 Anti-theft: select the anti-theft function line input foot, the selection is invalid will not enable this function

5.1.10 Seat Bucket: Select the seat bucket function line input foot, when seated, disengage the P gear and drive normally, otherwise it can not be driven. If push function is enabled, push assist will be activated when no passenger is seated. Selecting normally closed will recognize the bucket signal and push function according to the VCU instruction. Invalid selection will not enable this function.

5.1.11 Speed Limit: Select the speed limit function line input pin, invalid selection will not enable this function

5.1.12 Voltage switching: select the rated voltage switching function line input foot, selection of invalid will not enable this function voltage switching foot = PIN8 when the national standard speed limit for the voltage foot switching, speed foot special definition

5.1.13 One Touch Repair: Select the One Touch Repair function line input pin, an invalid selection will not enable this function. **Note that when selecting to turn on the Park function, the One Touch Repair pin serves as the switch for this function.**

Note that the other pins are generally not selected to be normally closed, except for the P-pin which may be selected to be normally closed, otherwise it will affect the use of the function. The optional pin definitions are described here

options (as in computer software settings)	6/12 take care (of) NS faculty columns	Universal Hall interface for older controllers	16G or more 485 Controller	YJCAN	YJBMQ CAN	Older Encoder Interfaces	note
normally	normally	normally closed	normally closed	normally	normally closed	normally closed	

5.2 special feature

5.2.1 High and low speeds:

1) High-speed only: High-speed gears only
2) Up and down gears: push button up and down gears
3) Tap High/Low: Tap 2 speeds: High + Low
4) High speed on tap: 2 speeds on tap: low + medium, (H58 version)
5) Tap 3-speed low: Tap 3-speed, default low gears
6) Tap 3-Speed Medium: Tap 3-speed, defaults to Medium Gear
7) Tap 3-speed high: Tap 3-speed, default high speed gears
8) Tap 4-speed low: Tap 4-speed, default low gears
9) Tap 4-speed 2: Tap 4-speed, default 2-speed gears
10) Tap 4-speed 3: Tap 4-speed, default 3-speed gears
11) Tap 4-speed high: Tap 4-speed, default high gears
12) Toggle 3-speed: Toggle 3-speed
13) Serial Gear: serial control gear, default serial meter for low gear booster. xm.
14) CAN Gear: CAN controlled gear, default low speed gear
15) null

5.2.2 Long press to back up:

When valid, you must long press the back button to toggle to backward. Invalid by default, toggles backward according to the backward line.

5.2.3 Gearing:

gear level (i.e. first gear, high gear etc)	clarification
0-Default Neutral	Startup defaults to N, FW ground = forward, RE ground = reverse.
1 - Default forward	Startup default forward gear, RE ground = reverse, can have P gear (s a m e a s N)
2 - Reverse Gap	FW grounded = neutral, otherwise RE grounded = reverse, RE overhang = forward
3-Default Tap Low	Series H: FW enters burglar alarm lockout while suspended. Grounding allows traveling Other series: default forward low speed
4-Default Points in Motion	Other series: default forward medium speed, pointing
5-Default point movement height	Other series: default forward high speed, pointing

5.2.4 Brakes:

Brake function: you can travel when you don't squeeze the brake, and disconnect the throttle when you squeeze the brake.

FLOATING: Pinch brake with high brake wire connected to 12V or battery voltage. Or the low brake leg is connected to battery ground. Note that the brake line signals are not isolated. When the brakes are not pinched, both wires should be floating.

Floatation disconnection: When the brake is pinched, both high brake and low brake wires are floating. When the brake is not pinched, the high brake wire is connected to 12V or battery voltage, or the low brake foot is connected to battery ground, note that the brake wire signal is not isolated.

P+Floating: In addition to the function of floating, release the P-gear state at the same time when squeezing the brake. P+Float Power-off: In addition to the float power-off function, squeeze the brake to release the P gear at the same time. Invalid:

Default float traveler.

5.2.5 PC13:

Parameters of the old controller: float travel, float disconnect, float cruise, ground cruise, invalid.

H series controller parameters: Normal response and track response.

5.2.6 Morse Code:

1) The Morse code can be changed through the host computer to set 6 digits to release the speed, no restriction when 000000, restriction when any other code: it is necessary to operate the Morse code every time the power is turned on in order to release the speed limit.

2) Setting the 7-digit Morse code is the speed limit switch, which also operates the last 6 digits, and the speed limit will be changed once: if it was a speed limit state, it will be changed to a non-speed limit state, and vice versa. This switch is saved inside the controller, and it will be switched to this state when the controller is turned on in the future.

5.2.7 Resident Slope:

Gear shift in hill: When in forward or reverse, letting go of the gas pedal will stop the hill, neutral will not stop the hill, and the function of steep hill descent is invalid. P gear hill stopping: hill stopping in P gear, in other states, according to the steep hill descent parameter setting whether to enable the steep hill descent function or not.

Invalid: the hill-stay function and the steep hill descent function are invalid.

5.2.8 Follow:

Follow: motor enabled for certain idle speed Invalid: shielded follow and e-brake

E-brake: activates the e-brake when you squeeze the brake.

Return throttle brake: electronic brake activated when returning throttle

5.2.9 Steep slopes slow down:

None: Steep hill descents are not enabled.

1~7: The smaller the number the slower the steeper the descent response, the larger the number the faster the descent response.

Parking effect: Steep hill descent will be more backward but smooth with small numbers, less backward but too big forward with big numbers.

5.3 BOOST

5.3.1 BOOST Duration:

Duration after BOOST startup defaults to 45 seconds, maximum 131 seconds;

5.3.2 BOOST interval:

The amount of time it takes to start BOOST again after BOOST has finished, default 90 seconds, maximum 131 seconds;

6 meter (i.e. measuring instrument)

6.1 Instrumentation

The controller is equipped with three signaling pins, of which

12-tube controllers and NS series controllers: 13-pin RXD, 18-pin ALARM/SPD, 9-pin SPA

Older controllers: 3-pin RXD, 9-pin SPD, 10-pin SPA, H-series controllers are labeled with characters A~G in the extension code.

6.1.1 Speed Pulse:

This value, 1-31, affects the pulse speed input 🎧 and the One-Wire Speed display. The higher the number, the higher the meter display speed.

6.1.2 Velocity pulse base:

The calibration base for the speed pulse meter. Changing this value only affects the speed display of the speed pulse meter. Hub default 40459, Center default 26043

6.1.3 Speedometer way:

Pulse/Analog/Isolated Pulse

6.1.4 **Analog speedometer**:

The phase line meter voltage indicates the coefficient used by the meter for speed, and adjusting this coefficient changes the displayed speed.

6.1.5 CAN:

Command number, default 60 for Hxx version, previous versions have different command numbers depending on the protocol.

CAN=59: Support for unmanned systems, special CAN configuration parameter required CAN=48: (H80 version) Switching from serial port to CAN analyzer for commissioning

6.1.6 CAN detection delay:

Default 150ms Individual customer request 1900ms

6.2 One Line Parameter

One line through the display pay attention to the pin not to be wrong: 12 tubes below the general choice of 18 pins one line through, individual driver sharing configuration with 13 pins one line through the NS series of 18 tubes above the controller with 12 tubes. 18 tubes above the old version of the controller is generally 9 pins one line through.

6.2.1 Step length:

Most one-line passes are either 0.5 or 0.9. Default 0.5, optional 0.

6.2.2 Interval length:

Most of One Line supports 55ms, default 55ms, optional 24 ms, 14

6.2.3 PULSE:

Default 0, non-zero for customization

6.2.4 SQH.

Default 0: not 0 when customized

6.2.5 Special Frames:

The following 0-255 define the special frame types.

<table>
<tr><th></th><th>special frame</th><th>clarification</th></tr>
<tr><td>1</td><td>0~1</td><td>not connected by a single thread
0: Speed pulse, (display adjustment: the larger the speed pulse base, the slower the display speed) 500~65530, V39 and earlier versions are 5000~65530)
1: READY Lamp(READY status is Loss🐶High, otherwise Loss🐶Low)
2:Fan control: (Temperature below 40° is output 🐶 high, above 40° is output 🐶 low)
3: Special Serial Command BF_ZHULI
4: Special serial port command ZHULI assists pulse detection (PIN3)
5: Special Serial Command KM5
6: Special serial port command UK1
7: Special serial port commands
Step length, interval duration, PULSE=0, SQH=0,DATA0-DATA1,SEC0-SEC7 Invalid</td></tr>
<tr><td>2</td><td>16~31</td><td>General One Line 2
Different meters, DATA6/DATA9/DATA10 need to send 🐶 different content, refer to the communication protocol to select the first content:
DATA6: Byte Option = 3 to output 🐶 0, otherwise to output 🐶 current value. Refer to the following table
DATA9 option: refer to the DATA9/DATA10 option table below DATA10 option: refer to the DATA9/DATA10 option table below
Special frame = 16 + DATA9 option + DATA10 option, general one line pass = 21
<table>
<tr><td>parameters</td><td>List of 6 groups of parameters, which vary from one One Line meter to another.
Same, commonly used for the first set of parameters</td><td></td></tr>
</table>
</td></tr>
</table>

		The recommended step size is 0.9ms, the recommended interval time is 144ms, some need 216ms to be normal. **SEC0~SEC7 Default All 0**
3	32~40	**No one-line pass, built-in Bluetooth** Special Frames: 32-TBIT, 33-XZ_CONTROL, 34-XMZSBXX, 35-XM3SPEED, 36-M2S, 37-CN **Step length, interval duration, PULSE=0, SQH=0,DATA0-DATA1,SEC0-SEC7 Invalid**
4	48~223	**Encryption One-Touch, Internal SEC** **Different meters, DATA6/DATA9/DATA10 need to send different content, refer to the communication protocol to select the first content:** Base = 4864 80 96 112 128 144 160 176 192 208  DATA6: **Byte option** = 3 to 0, otherwise to current value. **DATA9 option**: **refer to DATA9/DATA10 option table below DATA10 option**: **refer to DATA9/DATA10 option table below Special Frame** = Base + DATA9 option + DATA10 option **Suggested step length is 0.9ms, suggested interval length is 144ms, some need 216ms to be normal, PULSE=0,SQH=0. DATA0-DATA1,SEC0-SEC7 are invalid.** **SQH Hold Invalid at SQH=255 (Protocol Specific Requirements-H43 Edition)**
5	224~239	**Encryption One-Touch, External SEC** DATA6: **Byte option** = 3 to 0, otherwise to current value. **DATA9 option**: **refer to DATA9/DATA10 option table below DATA10 option**: **refer to DATA9/DATA10 option table below Special frame** = 224 + DATA9 option + DATA10 option **For professional use, all parameters can be modified:** **The recommended step size is 0.9ms, the recommended interval time is 144ms, some need 216ms to be normal.** **PULSE,SQH,DATA0-DATA1,SEC0-SEC7 can be modified.**

6	240~255	**Special Frames.** **241: ATN15 bytes (PULSE,SQH,DATA0-DATA1,SEC0-SEC7 invalid)** 242: No. 30 One-Way, P gear at DATA4 243: First line pass: 0x52,0x51 244: F2 one line through, SEC0 = 0 said F0, other numbers said F2 245: warning lamps synchronized to lose 🎧. **246: Must be specially framed when using the 485 interface = 246 Convenient PC 485 connection** 247: 15 Byte One-Wire Pass, **SQH Hold Invalid with SQH=255 (Protocol Specific Requirements - Version H43)** 248: 13-byte one-way, **SQH=255 with SQH hold disabled (protocol-specific requirement-H43)** **edition)**

cardinal number	DATA0	SEC0	
48	0X08	0X6B	.
64	0X07	0X9C	.
80	0X30	0X73	.
96	0X27	0X0E	.
112	0X10	0XBA	.
128	0X2B	0X2C	.
144	0X5	0XB2	.
160	0X5	0X2B	.
176	0X25	0XEA	.
192	0X0A	0X2C	.
208	0X1F	0X9E	.

parameters	parameter group.							
Parameter group code	31	26	5					
pacemaker	0.9	0.9	0.9					
Interval frame ms	144	216	144					
special frame	**248**	247	**247**					
PULSE	0	0	0					
SQH	0	0	0					
DATA0	(84) 0x54	0	7					
DATA1	(83) 0x53	0	0					
SEC0	0	0	156					
SEC1	0	0	247					
SEC2	0	0	207					
SEC3	0	0	202					
SEC4	0	0	187					
SEC5	0	0	11					
SEC6	0	0	170					
SEC7	0	0	127					
P Position	**3**	**1**	1					
Position of side supports	**2**	**1**	8					
Turning handle position	**0**	**8**	8					
anti-theft location	**8**	**0**	8					
current factor	**64**	64	64					
Byte Options	**3**	**3**	3					

Byte Options	0	1	2	3
DATA6	0	amps	amps	amps
DATA9	0-voltage	quantity of electric charge or current	quantity of electric charge or current	0
DATA10	quantity of electric	Percentage of current	input voltage	0

		charge or			
		current			

DATA9/DATA10 Configuration Options Table

DATA9 options (as in computer software settings)	DATA9		DATA10 options (as in computer software settings)	DATA10
0	Byte option = 0: Voltage unit 1V Byte option = 1:- Byte option = 2: Voltage unit 1V Byte option = 3:-		0	Byte option = 0:Power Byte option = 1: - Byte option=2:Second battery level Byte option = 3:-
4	Byte option = 0:Power		1	Byte option = 0: Current ratio

	Byte option = 1:power + 0x80 Byte option=2:First battery level Byte option = 3:-		Byte option = 1: - Byte option = 2:- Byte option = 3:-
8	Byte option = 0: Voltage Unit 0.5V Byte option = 1. Byte option = 2. Byte option = 3:-	2	Byte option = 0: Voltage unit 1V Byte option = 1: - Byte option = 2:- Byte option = 3:-
12	Byte option = 0: Group A voltage rating Byte option = 1: Group B rated voltage Byte option = 2: Group C voltage rating Byte option = 3: 0	3	Byte option = 0: Group A voltage rating Byte option = 1: Group B rated voltage Byte option = 2: Group C voltage rating Byte option = 3: 0

Special Frames = Base + DATA9 option + DATA10 option.

P Position	0-3: BIT position of byte 2 8: Not shown.	
	11: BIT position 3 of byte 4 (H40 increase) 13: Byte 2 = 0x0a/0x08 (H40 added) 14: Byte 2 = 0X0E (H40 added) 15: Byte 2 = 1/8 switching (H40 increase)	
Position of side supports	0-3: BIT position of byte 2 7: BIT7 of byte 3 8: Not shown.	
Turning handle position	0-3: BIT position of byte 2 8: Not shown.	
anti-theft location	0-3: BIT position of byte 2 8: Not shown.	

6.2.6 SPA Transmission 🎧 Signal Description:

1	Special Frames <16	Transmission 🎧 Analog Voltage
2	Special frame >=16, OBD is valid	For OBD warning light indication
3	Special Frames >= 16,OBD Invalid,New Country Marked speeding alerts are effective	Lose 🎧 high voltage when speeding
4	Special Frames >= 16,OBD Invalid,New Country Invalid speeding alerts	When there is an alarm, lose 🎧 alarm pulse. Without alarm, output 🎧voltage at P-pitch

6.2.7 DATA0:

HEAD Default 8, use other value for customization.

6.2.8 DATA1.

HEAD2, default 97, when using SEC0~SEC7=0

6.2.9 SEC0~SEC7.

Default 0, custom = not 0

6.2.10 P Position.

0-3: P gear in BIT position of byte 2

7: P file in BIT position 7 of byte 5 (V40 added)

8: P gear is not displayed.

11: P gear in byte 4 position 0 (V57 increase)

13: P file at byte 2 = 0x0a/0x08 (V40 added)
14: P file in byte 2 = 0X0E (V40 added)
15: P-phase switching at byte 2=1/8 (V40 increase)

6.2.11 Position of side supports

0-3: BIT position of side support at byte 2
7: BIT7 in byte 3 of side support
8: Side support in not showing.

6.2.12 Turning handle position

One line through the inside of the rotary control display bit (0~3, default 3） if not set to 8

6.2.13 anti-theft location

Burglar indicator display bit (0~3, default 8） if not set to 8

6.2.14 current factor

Default 64, 640=0.1A,320=0.2A 128=0.5A,64=1A,32=2A,

6.2.15 Byte Options

0, 1, 2, 3: contact remote drive to adjust parameters

6.2.16 one-stop debugging

Most of the One-Wire default 21, byte option = 3 can basically show the speed, some meters can not show. You can try to use 1-Wire but do not know the protocol, the step size is recommended 0.9ms, the interval time is recommended 216ms, try 1-Wire to see if the meter has feedback:

1) **Try special frame 16 first, byte option = 3.**
2) **Try parameter set 1 first: PUSLE=0,SQH=0,DATA0=8,DATA1=97.**
3) **If not, try parameter group 2: PUSLE=0,SQH=0,DATA0=89,DATA1=66.**
4) **If it does not pass then parameter other parameter groups. See the table that follows for details.**
5) **If all parameter groups are invalid, go to 3.2.**
6) **If special frame 16 does not respond, change to 16,32,48,64,80,96,112, 128,144,160, 176,192,208.**
7) **In general, try the above special frames to find the correct one line pass, for details of the voltage and power display is not correct, then a small range of special frame modification to meet the requirements: for example, to find 48 speed can be displayed normally, but the voltage and power or current display is not correct, then you can try to modify the special frame between 48 ~ 63 to correct the number. For example, if you find 160 speed can be displayed normally, but the voltage or current display is not correct, then you can try to modify the numbers between 160~175 in the special frame to correct the problem. If the display of P-position is inaccurate, you can modify the position of P-position to meet the display requirement.**
8) **If the above operations do not display the One-Wire communication correctly, try steps 3.1-3.3 again with a step size of 0.5ms.**
9) **For none of the above operations can you display a one-line pass. Consider special frames 247 or 248.**

10 If none of the above works, then you need to contact the remote driver to analyze the specific 224 or other special frames from 240~255.

6.3 Tire Ratio

Note that it has to be set correctly for the speed mileage calcu ect.

6.3.1 Tire width

Take 120/70/R12 as an example, tire width = 120

6.3.2 Tire Flatness

Take 120/70/R12 as an example, tire flatness = 70

6.3.3 Wheel R

As an example 120/70/R12, wheel R = 12

6.3.4 transmission speed ratio

Hall version of hub motor with pole pairs = 20, calculated for 4 pairs of poles
Transmission speed ratio = 20/5 = 5

6.3.5 mileage

Total miles traveled by the controller.

7 safeguard

7.1 voltage protection

7.1.1 Overvoltage protection, recovery.

Internal setting based on rated voltage

7.1.2 Undervoltage protection, recovery

When the battery voltage is close to the undervoltage protection point, the controller reduces the power transmission so that the battery will not be too discharged and damaged. The general battery undervoltage settings are as follows:

rated voltage	48V	60V	72V	84V	96V	108V
Undervoltage protection point	42V	52.5V	63V	73.5V	84V	94.5V

7.1.3 Undervoltage mode

2V: No power drop above 2V higher than the undervoltage point, and power drop starts when it reaches +2V of the undervoltage point.
4V: No power drop above 4V higher than the undervoltage point, and power drop starts when it reaches the undervoltage point +4V.
8V: No power reduction above 8V higher than the undervoltage point, and power reduction starts when it reaches the undervoltage point +8V.
12V: No power reduction above 12V higher than the undervoltage point, and power reduction starts when it reaches the undervoltage point +12V.
16V: No power drop above 16V higher than the undervoltage point, and start to drop power when it reaches the undervoltage point +16V.
Turtle power 5%: Battery capacity less than or equal to 20% power reduction, less than or equal to 5% adopts turtle speed home. Turtle power 6%: Battery capacity less than or equal to 30% power reduction, less than or equal to 6% of the turtle speed home. Tortoise power 7%: Battery capacity less than or equal to 40% power down, less than or equal to 7% using the tortoise speed home. Turtle power 8%: Battery capacity less than or equal to 50% power down, less than or equal to 8% using turtle speed home. Turtle power 9%: Battery capacity less than or equal to 60% down power, less than or equal to 9% turtle speed home.
Turtle power 10%: Battery capacity less than or equal to 70% power reduction, less than or equal to 10% using turtle home. SOP value: Limit power according to the maximum allowable line current SOP value received by the BMS/CAN bus.

Other:

7.2 temperature protection

7.2.1 Motor temperature protection, recovery:

Internal settings

7.2.2 Controller temperature protection, recovery:

Internal settings

7.2.3 temperature coefficient

Default 300=256+32+12 (new feature for H84)

	functionality		
+1	Magnetic Brake Switch	un-	Detecting electric door lock voltage
+2/4/6/8 /10/12/14	+2 only 1 battery = medium speed Battery SOC error large = low speed error small allows full speed +4 Restricted to medium speed +6 Unrestricted gears +8 Unrestricted gears +12: Default, reserved	un-	Battery does not limit gears
+16	Dual Battery SOP Enable Maximum current is limited by the battery output capacity value, note that it can only be used with CAN protocol.	un-	The current is not affected by the battery's CAN generation. SOP Limitations
+32	default (setting)	un-	Special: follow both forward and backward, follow Randomization factor = energy return factor
+64	Backward does not enable following	un-	Back Enable Follow
+128	Squeeze the brake and clutch. (brake sensor required)	un-	No brake clutch function
+256	Default: Enable acceleration control	un-	Shielded acceleration control
+512	The controller cooperates with the verification, and if not verified Certificate, report voltage alarm	un-	Controller requires no authentication
+1024	Low Medium High Speed Gear and Economy Line Sexual Motion Mode Binding	un-	Unbound, parameterized to specify economy Display Motion Mode
+2048	Low-speed motor off		Not added by default
+4096	Switching brake signal	un-	default (setting)
+8192	Pinch the brakes 3 times to release the P	un-	default (setting)
+16384	Press and hold P without un-pressing P	un-	unrestricted
+32768	reservations		

7.3 Functional protection

7.3.1 Lost turnbuckle alarm:

Valid/invalid

7.3.2 Throttle plug protection:

1 means that the throttle plugging and unplugging will cause a bailout to prevent flying cars caused by charged plugging and unplugging, 0 means no protection.

7.3.3 Back to P idle time:

Default 10 seconds

7.3.4 Seat bucket delay:

Default 1 sec.

7.3.5 Plug turn time:

The unit is 0.1 second, and a setting of 50 is 5 seconds.

7.3.6 Parking time:

Default 0.1 seconds, maximum 132 seconds; note that 0~131 seconds will cancel the parking when the time comes, while setting 132 seconds will park for a long time until the controller or the motor is over-temperature before and will cancel the parking.

7.4 battery protection

7.4.1 0 Power factor:

Calibrates the parameters displayed in the 0 capacity display.

The controller itself can estimate the battery charge, and by adjusting the 0 charge factor and the full charge factor you can get a more accurate display of the charge.

When the battery is full, adjust the full charge factor so that the displayed capacity is exactly 100%.

When the battery is dead, adjust the 0 capacity factor so that the displayed capacity matches the power level. For example, when there is 10% battery power left, adjust the 0 capacity factor so that the display will be exactly 10%.

7.4.2 Full power factor:

Calibrate the parameters of the full power display.

7.4.3 Limit starting power:

Starting power for power limiting algorithms

7.4.4 Limit speed limit power:

Limit Minimum Power for Power Limit Algorithm

7.4.5 Speed Limit Limit Factor:

Limit coefficients according to the power limiting algorithm

7.4.6 Turtle speed limiting factor:

Turtle current limiting factor default 53, Turtle current = User 🐢 Factory Maximum Current * Turtle Current Factor/2048 ;

7.5 Battery Characteristics

7.5.1 Battery Signal Source

options (as in computer software settings)	element	clarification
0	one-stop-shop	Obtaining the SOC of a battery through a one-line pass-through
1	serial port (computing)	Get the SOC of the battery through the serial port
2	CAN	Obtaining the SOC of the battery via CAN
3	li-ion battery	Simulation of SOC by Li-ion Ternary Battery Characterization Calculation
4	lead acid	Simulation of SOC by lead-acid battery characterization
5	Lithium iron (H72)	Simulation of SOC by LiFePO4 battery characterization calculation

7.5.2 current level

Displays the current battery level.

7.5.3 Battery Internal Resistance

Base value: 0~255, default 8

	functionality		
+256	**Measurement of second throttle/brake voltage**	**un-**	**Detecting electric door lock voltage**
+512	**PD Protocol**	**un-**	**OP Protocol**
+1024	**Protocol 2**		
+1536	**Protocol 3**		
+2048	**Protocol 4**		
+2560	**Protocol 5**		
+3072	**Protocol 6**		

Base value = 16053/16759 Allowed to turn on special weak magnetism (deep weak magnetism)

8 PID control

8.1 AN:

Motor body characteristic AN value, parameter range 0~16.

Standard tab motors AN=0. Standard IPM motors AN=16.

This parameter must be set in accordance with the characteristics of the motor. For hub motors, surface-mounted center motors, the AN is less than 8. For embedded center motors, the AN value is not less than 8. For encoder center motors with remote drive and automotive permanent magnet synchronous motors, AN=16 is used.

All hub motors on the market are surface-mounted motors, and the AN value is usually set to 0, not exceeding 4. Incorrectly set AN values can lead to lower starting efficiency.

Even present MOE/OVER protection.

8.2 LM.

Motor acceleration matching parameter, this value is used to adjust the smoothness of the motor running on the whole car. The default setting is 22 for cars and 18 for electric motorcycles, and some low-power tricycles are more suitable below 10.

However, some individual motor types are poorly matched to the vehicle, and the resonance judder is noticeable in the low and mid-speed segments at the start. Adjusting the LM value will improve the situation.

Start from 22, if the low-speed section of the acceleration jitter, then reduce the LM, from 16, 14, 12, 11, 8, 5 began to test the effect of the middle of those numbers will also play a role, generally consider that rather larger, try not to be too small. Too small will not be able to control the current, causing MOE/OVER protection, or even burn control. So when the jitter disappears after the LM value is the best parameter, do not adjust smaller.

Some motors and vehicles are very smooth at LM=22, but changing it to a smaller size will bring jerks instead, so be careful not to adjust this parameter if you have no problems at LM=22.

Or if you find that the jitter resonance is present after changing the LM value from 22 to 16, 14 [illegible] Even 5 has little effect, it means that it has nothing to do with this parameter, then it must be changed back to the maximum value, such as 22, instead of keeping a random number in the controller.

8.3 PID parameters: StartKI,MidKI,MaxKI / StartKP,MidKP,MaxKP.

Default parameters StartKI=4,MidKI=8,MaxKI=12 / StartKP=40,MidKP=80,MaxKP=120. The higher the motor power, the higher the voltage, the smaller the PID, the PID parameters can not be filled in casually, otherwise it will lead to abnormal operation or even burn control. The following are the commonly used PID setting parameters. There are 9 sets of parameters in total, choose one of them to match the motor vehicle and modify it under the guidance of professionals.

	StartKI	MidKI	MaxKI	StartKP	MidKP	MaxKP	
1	1	1	1	10	10	10	Surfboard Default
2	2	2	3	20	20	30	Ultra High Power Motor
3	3	3	4	30	30	40	
4	4	4	6	40	40	60	High Power Default
5	4	5	8	40	50	80	
6	6	6	9	60	60	90	Medium power motors
7	6	7	10	60	70	100	
8	8	8	12	80	80	120	Small and Medium Power Defaults
9	8	9	13	80	90	130	
10	8	10	15	80	100	150	
11	8	11	16	80	110	160	
12	10	12	18	100	120	180	
13	10	13	19	100	130	190	
14	10	14	21	100	140	210	
15	10	15	22	100	150	220	
16	16	16	24	160	160	240	Small power motors

Note that improperly set PID parameters can cause the system to work improperly, or even 🎧now MOE/OVER/PHASE faults, etc., and the difference is too large to cause burn-in, so pay special attention to it.
Note that some small power motor PID parameters exceed the debugging range of the controller, in this case, please contact the remote drive to solve the problem.

8.4 Speed SKI,SKP

SKI min. 1, max. 18, heavy car KI=18, light car KI=2, default KI=9, SKP5~20, default 10

8.5 MOE:

MOE defaults On to turn on the protection, select Off to turn off the protection, note that it is not allowed to turn off under normal circumstances.

8.6 Curve Sampling.

Sampling in ms intervals, Hxx and above have 2560 points in the acceleration curve, the following versions have a total of 510 points in the acceleration curve, e.g. if you set the sampling to 100ms, then the acceleration curve will have 510 points, and the total time will be 256 seconds/51 seconds.

8.7 special code

Normal code version	special code	releases	special code
Hall Speed 128 Regular	1	8x PID	+8
Hall Speed 256 Light Jump	2	Detecting brake	+16

9 Stats:

Hxx version valid

9.1 Average speed: current average
9.2 speed
9.3 Working hours: total
9.4 working hours
9.5 Average energy
consumption: current
9.6 average energy
consumption error
record (reserved)

10 Factory 2:

Customer Maximum Line Current:
Maximum line current of BOOST
Customer Maximum Phase Current:
Maximum phase current of BOOST

10.1 Backward current ratio:

Modify the maximum current factor for backward acceleration, backward maximum current = maximum bus current * factor/128.

10.2 Forward and reverse speed ratios.

A parameter required for forward and reverse gear shifting systems. 0~255

	added functionality		drop-in feature
+256	Reverse side support signal	un-	Reverse side support signal
+512	Allows small current switching	un-	Small current switching not allowed
+1024	Neutral Anti-Skid Parking	un-	The gap does not prevent backward skidding.
+2048	Record mileage	un-	Mileage not recorded
+4096	Extension code Y Lower magnetic brake switch	un-	Extended code Y under the Bullseye function
+8192	Downhill reverse charge overvoltage cutoff	un-	Downhill reverse charge control overvoltage
+16384	Shielded gear speed limit 2	un-	Enable gear speed limit 2
+32768	PD1 Input	un-	PD1 Loss

10.3 Voltage selection factor:

Selection of controller operating voltage by pin, calculation factor for low voltage selection.

For example, a 72V system with the voltage selection pin connected low becomes a 60V system with a factor of 60/72*128=107.

10.4 torque coefficient

Range 256~16384, default 8192

10.5 Weak magnetic current coefficient

Range 48~80, default 64

10.6 Backward acceleration factor:

Backward Maximum Acceleration Factor Default 32, Maximum 224

10.7 Alarm Delay:

Burglar alarm generates alarm recovery delay time setting, default 500ms Select a multiple of 100.

The use of digits:1~9 means that the brakes do not respond within 100RPM~900RPM. 0 means that the brakes respond.

Ten digits (H59)	One Line Display	When the READY lamp turns	One Line Electronic Brake Status (H60)
0	brake condition	go out (of a fire etc)	demonstrate
1	brake condition	go out (of a fire etc)	not shown
2	brake	resounding	demonstrate

	condition		
3	brake condition	resounding	not shown
4	brake failure	go out (of a fire etc)	demonstrate
5	brake failure	go out (of a fire etc)	not shown
6	brake failure	resounding	demonstrate
7	brake failure	resounding	not shown
8	brake condition	go out (of a fire etc)	demonstrate
9	brake condition	go out (of a fire etc)	not shown

10.8 Relay delay:

Setting the relay delay closing time after system power on: ms as unit, default 1ms, set to 1000ms if needed. Note: The new version of H44 controller has been changed to all function bits:

placement	sports event	Functional Description
BIT0	side support enabled (computing)	0:disable side support function, 1:enable side support function, default 1
BIT1	take up residence in a toilet	0:disable seat cushion function, 1:enable seat cushion function, default 1
BIT2	P-Phase Enable	0:Disable P-pitch function, 1:Enable P-pitch function, default 1
BIT3	Automatic return to P	0:disable auto return to P function, 1:enable auto return to P function, default 0
BIT4	cruise control	0:Disable cruise function, 1:Enable cruise function, default 1
BIT5	EABS Enable	0:disable EABS function, 1:enable EABS function, default 1
BIT6	go live (with a program)	0:disable boost push function, 1:enable boost push function, default 1, enabled When pushing, the P gear will be canceled automatically to enter the push mode.
BIT7	anti-theft	0: not forced anti-theft, 1: forced to enter anti-theft, default 0
BIT8	speeding alarm	0:disable speeding alarm function, 1:enable speeding alarm function, default 0
BIT9	Brakes don't release parking	0: braking will release parking, 1: braking will not release parking, default 0
BIT10	gear level memory	0: Gear memory off, 1: Gear memory active Default 1
BIT11	Default 1	
BIT12	Default 1	
BIT13	Default 0	
BIT14	fallback (computing)	0:disable backward function, 1:enable backward function, default 1
BIT15	relay time delay	0: no relay delay, 1: delay 1 sec, default 0

Relay delay = BIT15*2^15 + BIT14*2^14 + ... + BIT1*2^1 + BIT0.

10.9 **Slow start:**

Default 512

10.10 **Follow the RPM:**

Default 0, some customers need to back off within 100 revolution

10.11 **Current theft prevention;**

Default 0, anti-theft provide greater resistance difficult to push, do not consume battery. When it is 1, the anti-theft lock motor will lock the motor can not rotate, consume battery.

10.12 **Anti-theft pulse:**

Default 0	**The anti-theft signal is a level signal, pulling down the anti-theft.**
1 (overspeed alarm = 0)	**Anti-theft signal is a 1mS pulse signal, if there is a pulse, it is anti-theft.**
1 (overspeed alarm = 1)	**Pulse is GB data, low level is anti-theft.**
2	**Power on speed limit, pulse signal 8 to release speed limit**

Temperature 70:

Controller Temperature Protection 70 Algorithm:

0 indicates 50° start-up control for maximum time to protect battery, controller, and motor life and extend driving range.

1 Indicates that 70° starts the start-up control, and battery, controller, and motor temperatures are considered in a compromise between mileage and performance.

3 Indicates 80° start-up control, performance is prioritized, but mileage is shortest and rapid acceleration is most likely to cause over-temperature

protection.

10.13 **Reverse time:**

Time to activate jog and park when reversing, 3-48, default 36.

Odd: excessive gear lash, park flex. h78
Even: small gear lash, park
normalized H78
The Hall version has a reverse time of 7-11 which works well enough, with a minimum of 3. Note that too small a reverse time will tend to overshoot.
For the encoder version, a reverse time of 33 works well enough, with a minimum of 11, but note that too small a time can easily overshoot.

	added functionality		drop-in feature
+64	JL National Standard Status Maximum speed ratio for SEC5=48V Maximum speed ratio for SEC6=60V Maximum speed ratio for SEC7 = 72V	un-	common state
+128	Solve for P under 2	un-	Solve for P under 1
+256	Low-medium speed to high medium speed	un-	Default low to medium speed
+512	no audible alert	un-	There's an audible alert.
+1024	reservations	un-	
+2048	Masking the buzzer sound	un-	Buzzer Enable
+4096	Turn on the setback buzzer beep	un-	Masked backward buzzer beeps
+8192	Prohibition of Motor Angle Sensor Repair	un-	Allows motor angle sensor repair
+16384	Allows brake failure repair	un-	Prohibition of Brake Failure Repair
+32768	Reverse One-Liner	un-	direct line of sight (e.g. to the airport)

10.14 **Slow down the RPM**:
Steep gradient speed threshold, default 320, can be set 256~1024 to implement the speed adjustment also use this parameter.

10.15 **Retardation factor:**
Default 2, can be set 1-7, the larger the number, the slower the descent speed, note that the number is too large, the gear clearance will shake. The smaller the number, the faster the descent speed.

10.16 **0 Speed switching:**
Gear shift is allowed only when speed is equal to 0

10.17 **Deep weak magnetism:**
In the case of battery internal resistance = special value (please consult the far drive), the depth of weak magnetism (currently a motor factory absolute encoder motor special special dedicated) can only be set to 1 = effective. Otherwise, it will automatically return to 0=invalid.

10.18 **RS485 protocol:**
Extension code = "X": Protocol control in RS485 state, default connection to RS485 instrument, after connecting to computer host computer, it will automatically enter the communication mode with the host computer.
0: BMS protocol control for OEM YJs
1: VCU protocol for OEM PD, OP
2: VCU protocol control for OEM DP2 numbers
3: For OEM xxx VCU protocol control

4:ForOEMs。。。。。

5: TUYA control for OEMs

10.19 Serial port sharing:

Manufacturer's set value, no user alteration allowed.

	serial port (computing)	**clarification**
1	unshared	RXD Specialized for user serial port debugging and upgrading SPD pin is used to output speed pulse, one line pass Signal.
2	uplink sharing	**Legacy Controller, YJCAN Interface Board**

3	driver sharing	**12 Tube and NS Series.**
4	RS485	**Dedicated controller. 485 interface, note that the CAN+485 interface board should be selected as "not shared", otherwise the CAN+485 interface board will not be shared with the CAN+485 interface board.** **The CAN does not work properly.**

10.20 Self-learning throttle:

Default 24, maximum 36, note that self-learning requires the motor in the no-load state. Normal motor when starting self-learning 24 throttle enough, a small part of the motor does not turn up, increase the throttle to 36 to start the motor. If the self-learning motor does not rotate, it is likely that the hall wire error or phase wires are not connected in sequence. Check the hall wiring, or swap the blue and green phase wires and try to learn again.

Self-learning throttle = 23, 24, 25, 26, 27 corresponds to different idle strengths. 23 weakest, 27 strongest.

10.21 Self-learning voltage low (self-learning VQL).

Base Default Value 18432, Base Wide Range Value = 25856, Normally the default value is maintained.

add value	functionality		
+1	Activate idle clutch function (H67)	un-	No clutch function activated
+2	When voltage pin = PIN8(H72) PIN14 Pin Ground Soft Start, PIN8 Ground 60V, Suspended 48/72V Automatic Voltage Switching	un-	Voltage pin = PIN8: PIN8,PIN14 Dual line selector push down
+4	Reverse Neutral for Ignition Switch (H72)	un-	Normal reverse neutral function
+8	Knob to adjust maximum bus bar (H72)	un-	normal mode
+16	One-touch repair foot switching half current (H72)	un-	no switching
+32	Pinch 2x Brake Solution P (H72)	un-	normal P
+64	Press P first, then squeeze the brake to release P.	un-	normal P
+128	Single overload allowed (H74)	un-	Normal BOOST

10.22 Self-learning voltage high (self-learning VQH)

Base Default Value 24320, Base Wide Range Value = 31744, Normally the default value is maintained.

add value	functionality		
+1	Single overload allowed (H74)	un-	Normal BOOST
+2	Dual Throttle Voltage (H72)	un-	single throttle
+4	Center Throttle Neutral (H74)	un-	Normal throttle
+8	Effective one-click repair (H72)	un-	One-click repair doesn't work
+16	Enhanced input signal filtering (H72)	un-	Normal Input Filtering
+32	Cruise speed unlimited, pushing acceleration Degree controllable (H72)	un-	Cruise limited to 3/4 max RPM, pushing the slowest
+64	Six-fold speed Hall detection (H72)	un-	Single Speed Hall Detection
+128	New MTPA Vector (H73)	un-	Conventional MTPA Vector

Switch forward and backward

11 calibrate

11.1 Voltage:

Displays the input voltage of the controller

11.2 Number of calibrations:

Displays the number of controller parameter modifications

12 correspond (by letter etc)

12.1 communications serial port

Port: Depending on the user's computer, check the COM port number in the Device Manager to select it.

Baud rate: fixed 19200.

12.2 Software upgrades:

Only the code is upgraded, no parameters are changed.

12.3 Brush:

Upgrade the code while resetting to the parameters that come with the program. Note that the HXX version brushes the data clear but not with customer data, you also need to use the HEB file to download the data inside the controller.

12.4 manipulate

Self-learning:

initiating self-learning **canceling self-learning**

Save: Save the data to the controller internal, the next reset start using the new data work. **12.5 Product number**

Controller Internal Product Number: The controller's unique number, used for product registration and password retrieval.

12.6 Area, type of control: reserved

12.7 Log in:

The generated version of the software can be set with a 30-digit password, allowing the controller to modify parameters only if the password is entered.

Ordinary models do not have a password, some models of controllers according to the requirements of the 🎧 factory set 30-digit password, set the password

The user can only view the parameters and status after the code. Click Login and enter the correct 30-digit password to modify the parameters.

12.8 Recovery 🎧 Factory

Restore the parameters that come with the 🎧 Factory Program BIN file.

12.9 Open CAN

Turn on the CAN analyzer, connect the controller, and debug.

12.10 Close CAN

Shutting down the CAN analyzer

13 Data copy:

Batch view and adjustment of controller data and CAN bus data for Hxx and above:

13.1 Get controller data:

1) Batch Download Parameters button on the right: Opens the Batch Download

Parameters window. 

Click "Get controller data".

2) The CAN protocol format parameters within the controller can be displayed in the dialog box.
3) Tap the Cancel button to return to the main menu.
4) Save your own controller parameter file by clicking on the main icon in the upper left corner and selecting Save as heb file.

13.2 Download heb data.

1) Connect the controller, open the host computer, click the main icon in the upper left corner, select Open a "heb" file (e.g. GX72400_13_A.heb), and the dialog box will pop up automatically.

2) Tap "Data Download to Controller", you can see the matching number progress bar gradually full frame, the controller will prompt the alarm sound, tap "Controller Write and Reset", the controller data according to the new data to work.

3) Tap Cancel to exit the dialog box.

13.3 CAN protocol data:

13.3.1 CAN control

13.3.1.1 Data format:

1) **CAN data segment information byte location map:**

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte1	7	6	5	4	3	2	1	0
Byte2	15	14	13	12	11	10	9	8
Byte3	23	22	21	20	19	18	17	16
Byte4	31	30	29	28	27	26	25	24
Byte5	39	38	37	36	35	34	33	32
Byte6	47	46	45	44	43	42	41	40
Byte7	55	54	53	52	51	50	49	48
Byte8	63	62	61	60	59	58	57	56

Example of sending sequence:

BYTE:1, 2, 3, 4, 5, 6, 7, 8

bit:7 6 5 4 3 2 1 0, 15 14 13 12 11 10 9 8, ..., 63 62 61 60 59 58 57 56.

Data format: INTEL/MOTOROLA two optional, according to the protocol requirements to choose.

2) **INTEL format:** small end mode.

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte1	The	The	The	The	The	The	The	LSB
Byte2	MSB	The	The	The	The	The	The	The
Byte3	–	–	–	–	–	–	–	–
Byte4	–	–	–	–	–	–	–	–
Byte5	The	The	The	The	The	The	The	LSB
Byte6	–	–	–	–	MSB	The	The	The
Byte7	–	–	–	–	–	–	–	–
Byte8	–	–	–	–	–	–	–	–

Physical conversion example:

RPM=4000RPM,physical signal value=precision*signal logic value+bias,precision=0.25,bias=0;then hexadecimal is 0x3E80(16000d),message BYTE1=80H,BYTE2=3EH

3) **MOTOROLA Format:** Big End Mode:

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte1	MSB	The	The	The	The	The	The	The
Byte2	The	The	The	The	The	The	The	LSB
Byte3	–	–	–	–	–	–	–	–
Byte4	–	–	–	–	–	–	–	–
Byte5	–	–	–	–	MSB	The	The	The
Byte6	The	The	The	The	The	The	The	LSB
Byte7	–	–	–	–	–	–	–	–
Byte8	–	–	–	–	–	–	–	–

Physical conversion example:

RPM=4000RPM,physical signal value=precision*signal logic value+bias,precision=0.25,bias=0;then hexadecimal is 0x3E80(16000d),message BYTE1=3EH,BYTE2=80H

13.3.1.2 Receive frame type:

Selectable standard frame, extended frame

13.3.1.3 Send frame type:

Selectable standard frame, extended frame

13.3.1.4 SOP_ID,SOP unit, SOP high byte position, SOP low byte position:

BMS Maximum Allowable Discharge
Current Value, 2 bytes representation.
SOP_ID: ID number of the SOP
instruction.
SOP unit: Generally set to 0.1A, or 0.25A or 1A. SOP high
byte position (0~7 corresponds to BYTE1-BYTE8)
SOP Low byte position (0~7 corresponds to BYTE1-BYTE8)
SOP value = (value of SOP high byte position * 256 + value of SOP low byte position) * SOP unit (A)

13.3.1.5 SOC_ID,SOC Location.

The current power percentage value of BMS,
full power=100, no power=0. SOC_ID: ID
number of SOC command.
SOC Position: 0~7 corresponds to BYTE1-BYTE8.

13.3.1.6 Charge ID, Charge Byte Position, Charge BIT Position.

Charge ID: ID number of the charge command.
When both the byte position and the BIT position are
0, stopping occurs as long as there is an ID number.
When the position is not 0, it stops when the
position is set to 1.

13.3.1.7 Edge Support ID, Edge Support Byte Position, Edge Supp

Edge Support ID: The ID number of the edge support command.
Set to 1 when the side supports are up to disallow traveling, and set to 0 when the side supports are closed to allow traveling.
In the case of a dual battery system, this ID is the charging anti-running ID of the second battery, the contents of which are the same as in 12.3.1.6.

13.3.1.8 3-Speed ID, 3-Speed Byte Position, 3-Speed BIT Position

3-Speed ID: ID number of the 3-speed command.
Three speeds totaling 2 digits, 0 for 1st speed, 1 for 2nd speed, 2 for 3rd speed, 3 for 4th speed
/boost speed. The 3-speed low position is in the specified BIT position and the high position is in the BIT+1 position.

13.3.1.9 Gear ID, Gear Byte Position, Gear BIT Position

Gear ID: ID number of the gear command. Note that the gear control is used and the reverse is fast.
The gears have a total of 2 positions, 0 for N, 1 for forward and 2 for reverse. The low position of the gear is in the specified BIT position, and the high position is in the BIT+1 position.

13.3.1.10 Control ID, control type, control byte position.

Control ID: The ID number
of the control command.
Control Type:

sports event	==1	==0
BIT0	+1: Unmanned display	+0 Other items shown

BIT1	+2: Serial number	+0 Error log
BIT2	+4: Separate display for low/high speed	+0 Normal 3-speed display
BIT3	+8: Display of laps	+0 Display total mileage
BIT6~BIT4 special control	0=+0: unmanned 9 3=+48: Unmanned 59 6=+96: Dual battery system 7=+112: Dual battery systems - TCSID	1=+16: ZN/YJ based on BMS remaining battery capacity SOC 2 = +32: total mileage handshake 4=+64: Feedback on demand 5=+80: TCS-ID
BIT7	=+128 Display current mileage	Display of remaining mileage

On-demand commands: 12, 13, 14, 15 correspond to Send ID2, Send ID3, Send ID4, Send ID5 respectively.

Under the dual power system, this control ID is the SOPID of the second battery, the content is the same as 12.3.1.4, and the SOC ID of the second BMS is the same as this ID.

13.3.1.11 OBD_ID

OBD ID number, standard frame is 7DF.

13.3.2 CAN Transmit ID

The controller has set up 6 ID numbers to send data.

Send ID0 Timing~Send ID5 Timing is the timing count in 10ms, 0 means 10ms, 1 means 20ms, 2 means 30ms...,199 means 2000ms.

Send ID2 timer ~ Send ID5 timer must be >=4 i.e. 50ms. less than 4, it will be sent on demand according to the command received from CAN.

13.3.3 CAN Rule Description:

The CAN send content consists of 21 data, 17 status and 14 alarm messages. Each content includes the following definitions:

13.3.3.1 Length:

This refers to the number of BITs required for the data. For example, speed, current, and voltage are usually 16 bits, gear position is 2 bits, and alarm status is usually 1 bit.

13.3.3.2 placement

For the position of the LSB of this data in the CAN frame, see the "CAN Data Segment Information Byte Position Diagram" above.

13.3.3.3 gain (electronics)

The coefficients * are required for this data. Default gain = 1

1) Customer code, serial number, hardware version, software v
2) Current voltage unit 0.1V, gain = 1
3) Current current unit 0.1A, gain = 1
4) Current phase current unit 0.1A, gain = 1
5) Throttle opening, gain = 1
6) Throttle voltage unit 0.01V, gain = 1
7) Current torque unit = 0.1Nm, gain = 1
8) Current speed, gain = 1
9) Current RPM unit = 1RPM, gain = 1
10) Total distance traveled 16 digits higher, unit=0.1Km, gain=1
11) Total distance traveled 16 bits lower, unit=0.1Km, gain=1
12) Current mileage unit = 0.1Km, gain = 1
13) Controller temperature in °, gain=1, bias=40
14) Motor temperature in °, gain=1, bias=40
15) Battery level in %, gain=1
16) Status, Alarm: Gain = 1

13.3.3.4 ID

Serial number of this data transmission ID (0~5, corresponding to CAN transmission ID0~CAN transmission ID5)

13.3.3.5 active symbol

Valid: This data is reported to the CAN bus in the specified BIT,BYTE position. Invalid: This data is not reported on the CAN bus.

13.3.3.6 bias voltage

Temperature bias 40, other default bias = 0:

1) Controller temperature in °, gain=1, bias=40
2) Motor temperature in °, gain=1, bias=40

13.3.4 CAN Data

There are a total of 21 data items that the user can choose to report or not report:

sports event	element	Default value
1	client code	2 letters
2	Sequence number 0	16-bit digital
3	Sequence number 1	16-bit digital
4	Serial Number/Error Code	16-bit: according to the control word
5	hardware version	8-bit
6	Software version 0	8-bit
7	Software Version 1	8-bit
8	input voltage	16-bit
9	amps	16-bit
10	phase current	16-bit
11	Throttle opening/control data	8/16-bit, driverless project display control data
12	Throttle voltage/control command	16-bit, driverless project display control commands
13	torsion	16-bit
14	current velocity	16-bit
15	current speed	16-bit
16	Total mileage/laps High 16 digits	16-bit: according to the control word
17	Total mileage/laps Low 16 digits	16-bit: according to the control word
18	Current Mileage / Remaining Mileage	16-bit: according to the control word
19	Controller temperature	8-bit
20	Motor temperature	8-bit
21	current level	8-bit

13.3.5 CAN status:

There are a total of 17 statuses that the user can choose to report or not report:

sports event	element	Default value
1	gear level (i.e. first gear, second gear)	2 bits SEC3=1: P send 0, reverse send 1, neutral send 2, forward send 3 SEC3=2: reverse send 3, neutral send 2, forward send 1 SEC3 = Other: neutral = 0, forward = 1, reverse = 2.
2	Three speed status	3 digits: Low/high speed status according to the control word [ZN gear display, SEC1=1 high speed low speed reverse display SEC1=2: 123 backward, BST,P gear display SEC1=3:Neutral 0, gear display = 1, 2, 3

		SEC1=4:Neutral 0, Reverse 5, Gear display 2,3,4 (H62) SEC1=5:Neutral 0, Reverse A, Gear 1,2,3 SEC1=6:Neutral 0x20,Reverse 0x80,Forward 0,1,2 SEC1=7:Neutral 0,Reverse 3,Medium 0,Low 1,High 2 SEC1=8:Neutral 5, Reverse 4, Low Speed 1, Medium Speed 2, High Speed 3, SEC1=9:Neutral 0, Reverse 3, Low Speed 0, Medium Speed 1, High Speed 2 SEC1=10:Low Speed 2, Medium Speed 0, High Speed 1 SEC1=11:Back 0,Low 1,Medium 2,High 3 SEC1=12:Neutral SEC6,Back SEC5,Low Medium High SEC234 SEC1=other: gear display=0,1,2
3	brake condition	1 position
4	cruise state	1 position
5	pedestal state	1 position
6	edge support sth.	1 position
7	speed limit	1 position
8	restoration status	1 position
9	Backward state/motor direction	1 position, unmanned program showing motor direction
10	Boost status/direction of rotation	1 digit, unmanned program display turning direction
11	Push Status/Master Relay	1 digit, unmanned program displays main relay status
12	Parking P-gear status	1 position
13	state of charge	1 position
14	READY status	1 position, no alarm in gear can turn normally when light, turn off after turning.
15	ECO state	1 position
16	ABS status	1 position
17	BOOST status	1 position

13.3.6 **CAN Alarm**

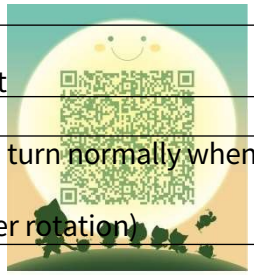
A total of 14 alarms, user can choose to report or not t

Sports steering event

Default value

(CAN58 special: remains on after rotation)

1	Motor Hall Failure	1 position
2	turnbuckle failure	1 position
3	brake condition	1 position
4	MOS Failure	1 position
5	phase line short circuit fault	1 position
6	Phase line missing fault	1 position
7	Controller over-temperature alarm	1 position
8	Motor over-temperature alarm	1 position
9	overcurrent alarm	1 position
10	overpressure alarm	1 position
11	undervoltage alarm	1 position
12	blocking and alerting	1 position
13	anti-theft alarm	1 position
14	Controller Alarms	1 position



14 Controller Model Description

Controller Model 1: ND 72 530 B _ 1 3_ A R H 68

- Controller Customer Code (AA-ZZ)
- Controller rated voltage (V)
- Maximum phase current of controller (A)
- Controller type (B for encoder version, otherwise Hall version)
- Controller current sensor type (1~9)
- Controller application type (0~9)
- Controller Function Code (0~9,A~Z)
- Controller extension code (*,0~9,A-Z)
- Controller hardware version (0-9,A~Z)
- Controller software version (00~99)

Controller Model 2: YQ 72V 270A B _ 1 3_ A R H 68

- Controller Customer Code (AA-ZZ)
- Rated voltage of controller (V)
- Maximum bus current of controller (A)
- Controller type (B for encoder version)
- Controller current sensor type (1-9)
- Controller application type (0-9)
- Controller Function Code (0-9,A-Z)
- Controller Extension Code (*,0-9,A-Z)
- Controller Hardware Version (0-9,A-Z)
- Controller software version (00-99)