fardrive controller description

1.parameters

1.1 Basic parameters of the motor

1.1.1 Position sensor, the controller has 4 different hardware types according to the position sensor:

1）The Hall version
2） Incremental encoder version
3） Differential encoder version
4） Absolute value encoder version
5） Encoder version

order number	option	Controller hardware	Extended code	edition
0		The Hall version controller		H,R,I
1	The regular incremental encoder	Encoder version controller		H ,R,I
2	Regular incremental encoder 4096	Encoder version controller		H ,R,I
3	Regular incremental encoder 8192	Encoder version controller		H ,R,I
4	Differential encoder 2048	Differential encoder controller	Built-in J, and external Q	H ,R,I
5	Differential encoder 4096	Differential encoder controller	Built-in J, and external Q	H ,R,I
6	Differential encoder 8192	Differential encoder controller	Built-in J, and external Q	H ,R,I
7	Differential encoder 16384	Differential encoder controller	Built-in J, and external Q	H ,R,I
8-12				
13	Absolute value encoder 13	Absolute value encoder controller	Built-in H, external P	H ,R,I
14	Absolute value encoder 14	Absolute value encoder controller	Built-in H, external P	H ,R,I
15	continue to have			
16	60° Hall	The Hall version controller		H,R,I
2-15	2 - 15 corresponds to the rotational polar number	Rotary version controller		X,U

Modify the sensor, the key save is effective. Hxx and above versions support optional. The old version is not optional.

Hardware version	explain
7	The controller version of the earlier years ago, with a single function, is relatively solidified
G	The controller version of the earlier years, with a single function, is relatively solidified
A	The new version, support some parameter settings, single function, relatively solidified
B	The new version, support some parameter settings, single function, relatively solidified
H	Latest, standard edition, this, rich in parameters
R	Llatest, national standard version, 6 core + 8 core + 16 core socket, rich parameters
I	Latest, isolated 144V version, with rich parameters
X	The latest, rotary version, rich parameters
U	The latest, isolated 144V rotation version, rich parameters

There are many kinds of software programs, no longer one example:
The Special code shows whether it is a special program:

code name	meaning
4096 and above	High-speed version of the program
2048~4095	Quarantine program
256~2047	Specific controller program
128~255	No Bluetooth 485 communication program

In addition, there are users of the special requirements of a variety of specific programs, not reflected in the code name.

1.1.2 Temperature sensor:

option	Hxx edition	legacy version
not have	√	√
PTC -1000	√	√
NTC -230K	√	√
KTY 84-130	√	The program was fixed with KTY 84-130 / KTY 83-122
invented	√	√
KTY 83-122	√	×
NTC -10K	√	×
NTC - 100K	√	

1.1.3 Phase shift:

The key characteristics of the motor Angle position, and the general motor factory will indicate the Angle position. Most of the cities are 30°, 210° and 90°, but some motors are special. Note that the motor factory standard method and the remote drive mark are different. If this Angle is not clear, this value can be found through the AutoLearn method. Generally, the error of two phase shifts is not more than 2° proves that the operation method is no problem, and the phase shift is no problem.

1.1.3.1 Start AutoLearn through 11.3 host computer:

Click the upper computer AutoLearn button, the controller will hear 2 short a long sound, prompt AutoLearn has been started. In addition, click the upper machine to cancel the AutoLearn button, the prompt sound disappears, that is, cancel the AutoLearn.

1.1.3.2 Start the phase shift AutoLearn method by pinching the computer:

This method is adapted to the all controllers installed with the brake line function, software version 783, above the ND series, CN series, BN series controller. A01 above version requires the boot before the boot, do not loose, do the following operations.

1: Keep the brake well connected, the controller is turned off, and the motor is still.

2: turn to the end, boot, this time the controller alarm, the motor will not turn.

3: Enter the AutoLearn, Morse password 8 bits: 11000000.

1= "long pinch brake 0.5 seconds ~2 seconds", 0= "short pinch brake 0.5 seconds or less"

After hearing 2 short and 1 long, it is to enter the AutoLearn state. If you do not hear the consideration operation error, re-enter the Morse password to try.

1.1.3.3 AutoLearn process:

After entering the AutoLearn state, the wheels are overhead and the wheel turns to the end. At this time, the motor should turn up. If it does not turn, the Hall line may be one that has been exchanged, or the motor line has been exchanged. At this point, you only need to exchange the blue and green line, and you can turn up.

After turning, the speed will be close to the fixed speed of the motor, and then the phase shift will be automatically adjusted to adapt to the motor, reversing the electric opportunity and adapt the motor.

After automatic completion, the motor stops. Release the throttle. Complete self-study.

Learn good electricity opportunities to stay quiet state.

1.1.3.4 Moss password change motor direction:

After the completion of learning, if it is found that the normal starting motor is reversed, then the direction of the motor can be modified through the upper machine, or the motor direction can also be changed through the Moss password: Moss password 8 bits: 11110000. If electricity is found, the machine reverses the motor after learning, and the motor direction can be corrected through this instruction.

1.1.3.5 Moss password change speed limit:

Change the Mose password through the upper machine can set 6 bits to open the speed, for 000000 does not limit, limit the speed for other passwords: each time when the boot must operate the Mose password to remove the speed limit.

Setting the 7-bit Moss password is the speed limit switch, which is also the 6 digits after the operation, and the speed limit conversion once: if the speed limit state, it becomes a non-speed limit state, and vice versa. This conversion is saved inside the controller, and the boot is switched to this state.

1.1.4 Polar logarithm:

Hall's motor default 4 does not need to be changed. The polar logarithmic setting of the encoder motor must be accurate or not can turn. Optional value =3,4,5,6,7,8,10,12,14,16~30, encoder: 3-8 actual speed, 10, above the 4. Modify the extreme logarithm, the key to save is effective.

1.1.5 Motor direction:

The motor direction forward 0: motor right, 1: motor left. Only after the reset preservation.

1.1.6 Rated speed: the speed of the motor at the rated voltage, referred to as the rated speed, which is often called the fixed speed in the electric motorcycle industry. This constant speed determines the highest motor speed. General general controller, in the rated voltage state, can drive electricity

The maximum machine speed is near the fixed speed. The controller recognizes the rated speed at the current voltage during AutoLearn.

1.1.7 Rated voltage:

The maximum number of batteries of Nanjing remote drive controllers with different voltages is as follows:

	lead-acid cell	Three yuan lithium battery	Lithium-iron phosphate batteries
48V	4 String	13- -14 A-string	16 Strings
60V	5 String	17 Strings	20 Strings
72V	6 String	21 Strings	24 Strings
75V	6 String	22 Strings	25 Strings
84V	7 String	24 Strings	28 Strings

96V	The string of 8	28 Strings	32 Strings
108V	Nine string	32 Strings	35-36 strings

The factory sets are 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 the factory voltage, after setting the parameters, to save, effective after reset.

1.1.8 Rated power: The rated power of the motor shall be set according to the actual situation of the motor.

1.1.9 Maximum speed: limits the maximum motor speed.

1) In the electric vehicle market, the maximum speed is generally not limited, but through the following current limiting parameters to limit the maximum speed. After the speed exceeds the fixed speed, it automatically enters the weak magnetic state. The more the speed exceeds the fixed speed, the greater the weak magnetic depth.
2) Weak magnetic depth: (maximum speed-fixed speed) / fixed speed * 100%.

General hub motor weak magnetic depth
can reach 50%.

Some hub motors can have a weak magnetic depth of more than 100%.

Therefore, we stipulate that the weak magnetic depth of the surface attached motor should not exceed 50%, while the weak magnetic depth of the embedded motor should not exceed 150%.

1.1.10 Maximum phase current:

Maximum current of working motor. Dedetermines the maximum torque output of the motor at stationary to rated speed.

The maximum phase current has the maximum limit on the controller hardware, and the set value is not allowed to exceed the factory setting. Otherwise, the probability of the controller burning out is greatly increased.

Different types of motors will have different output torque at the same maximum phase current set value. The torque version motor torque output,
the balanced version output is slightly smaller, the speed version motor
output is minimum. The motor with low constant speed output high torque,
and the motor with high constant speed has low output torque.

1.1.11 Maximum line current:

Controller operating battery bus current maximum. It determines the maximum power value of the motor output. Controller maximum input power = cell voltage * maximum line current.

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

1.1.12 Back rotation speed:

Maximum speed of backgear.

1.1.13 Exchange phase line:

Default 0, blue and green large line exchange, it is 1

It is effective after reduction. The Hxx version of AutoLearn will automatically modify this parameter.

1.1.14 Weak magnetic properties:

Generally fast, high-speed jitter changed to large, generally do not use slow, easy to flow

1.1.15 Weak magnetic response:

0~6, no representation is not weak magnetic. Default weak magnetic response: 0

Expansion: Push the motor speed to a higher speed than the fixed speed, called expansion.

Expansion method 1: increase the working voltage, the higher the voltage, the higher the motor speed.

Expansion ding method two: do not increase the working voltage, through weak magnetic, increase the motor speed.

Without changing the battery voltage, directly control the current limiting parameters to increase the motor speed.

1.2 Increase and deceleration characteristics

1.2.1 Acceleration sensitivity:

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

The electric car is usually the accelerator pedal, while the electric motorcycle is the throttle knob or the central control.

Electric cars to the throttle response is moderate, and the requirements of electric motorcycle is different, some customers requirements to light, slow, stable, some customers are required to be sensitive, a trigger.

Acceleration sensitivity refers to the speed of the throttle reaction. This parameter is between 16 and 224. The larger the number, the more sensitive the throttle acceleration is.

16 has been very slow, electric cars are generally set at around 32 suitable, rarely more than 64.

For electric motorcycle, in addition to setting at 32, many users prefer to respond quickly, so set at 64,128. Track race is even set at 224.

1.2.2 Deceleration sensitivity:

Slow down speed: 16~224, the larger the number, the shorter the throttle lag.

1.2.3 Motor position:

Non-set point, display the motor angle

1.2.4 Return to the throttle:

Default 0

1.2.5 Throttle response:

For different user preferences, there are three configurations of the transfer features: linear, movement, and economic.

1.2.6 Economic Acceleration parameters:

Default 8

1.3.1 Throttle threshold

Untransfer on the market, different transfer or accelerator pedal voltage value will be different

	Idle voltage	Full voltage
Electric motorcycle handlebars	0.8V—0.9V	4.1—4.3V
Central control transfer	0.8V—0.9V	4.5—4.95V
The 12-V accelerator pedal	0.0V-0.2V	4.6—4.8V

1.3.1 Low-threshold value:

We set the low throttle threshold based on the idle voltage. Considering the converter voltage fluctuation, setting the low throttle threshold is generally 0.2—0.3V higher than the idle voltage to ensure that the motor works in the idle state when stopping.

For example, the low throttle threshold of the electric friction wheel is set to 1.1V, while the low throttle threshold of the 12V accelerator pedal
is set to 0.5V.

1.3.2 High threshold value:

We set the high throttle threshold based on the full voltage. In order to enable the controller to output full power in the full bar state, we need to let the set value be below the full voltage. But be careful not to set it too low here. In order to automatically detect whether the electronic throttle is damaged, we set a value of 0.6V higher than the high throttle threshold as the alarm limit. Once it is exceeded, it is considered that the switch is damaged, and the controller immediately stops the power output, so as to avoid the vehicle safety accident.

So when we set the high throttle threshold, such as the electric motorcycle turning the full 4.1—4.3V, we will set the 3.9V as the high throttle threshold. For the high throttle threshold of the 12V accelerator pedal, we will set it at 4.3V.

The 742 and above versions add the throttle AutoLearn function. When the controller turns to the bottom, the controller will automatically recognize the maximum voltage of the throttle signal of the knob / pedal, and generate the throttle high threshold according to this voltage.

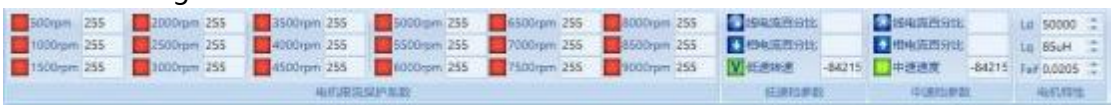
1.41 Product model

1.4.1 Date:

1.4.2 Time:

1.4.3 Model: Controller model

2 Current limiting



2.1 Protection coefficient of motor:

500 RPM, 1000 RPM, 8500 RPM, 9000 RPM conversion.

These speeds are scaled in the parameter. The corresponding parameter is also the parameter at this rotational speed. For the actual pole logarithm is greater than or equal to 16 motor, you need to do a conversion.

Usually the polar logarithm of the hub motor is 16,20,24,28,30 opposite poles.
Usually the middle motor is 3,4,5,7,8,14 opposite poles.

In the case of the pole log in the parameter =4, the motor speed = the upper engine speed * 4 / the actual pole log of the motor. For example, the hub motor pole log is 16
like that
The actual speed of the 16 pairs of pole hub motors corresponding to the 500 RPM is 125 RPM.
The actual speed of 16 bipolar hub motors corresponding to 1000 RPM is 250 RPM.
The actual speed of the 16 paired-pole hub motors corresponding to 4000 RPM is 1000 RPM.
The actual speed of 16 opposite pole hub motors corresponding to 5000 RPM is 1250 RPM.
The actual speed of the 16 paired-pole hub motors corresponding to the 5500 RPM is 1375 RPM.
The actual speed of 16 paired-pole hub motors corresponding to 6000 RPM is 1500 RPM.
The actual speed of 16 bipolar hub motors corresponding to 6500 RPM is 1625 RPM.
The actual speed of the 16 paired-pole hub motors corresponding to the 8000 RPM is 2000 RPM.

Weak magnetic limit: gradually increase the flow limiting parameter
The setting of the current limiting value, starting from the safety value, gradually increase the speed, we must ensure that the weak magnet can not be excessive.one
If the idling speed is unstable or even the MOE or OVER protection indicates that the speed is too high, the weak magnetic force is excessive, and the parameters should be changed.
The current limit value we set should be considered according to the actual demand. For motors with a fixed speed of 1000 RPM, a weak magnetic depth of 50% is considered. Max speed is also considered at 1500 RPM, and wants the motor not to work at 1625 RPM
more than. Therefore, the current limit value is set at 6000 RPM, and the speed of 6500 RPM and above is set at less than 5%. This ensures that the motor in idling is also weak magnetic 50%. And not weak magnetic too deep cause motor jitter or even burn control.
For many motors, the weak magnetic depth can reach 100%, and the 1000 RPM motors can work at 2000 RPM high speed. For this motor, in order to play a higher performance, the flow limit coefficient can continue to expand. The flow limit parameter within 8000 RPM can be set according to the normal value above 70, and 8500 is set at 30,9000 RPM below 5.

2.2 Speed control level:

Speed control level: default 4 levels: BOOST, high speed, medium speed, low speed.

1) BOOST file: Bst is displayed on the mobile phone APP / computer. In the BOOST function on effective, BOOST time by

4.3 Parameter control, BOOST works under the limited condition of the factory customer maximum line current, maximum phase current and current limiting coefficient.

2) High-speed gear: D is displayed on the mobile phone APP / computer. High speed gear operates by the maximum line current, maximum phase current, current limiting coefficient and maximum rotation speed limit.

3) Medium speed gear: DM is displayed on the mobile phone APP / computer. Medium speed gear is limited by medium speed line current ratio, medium speed phase current ratio and medium speed speed.

4) Low speed gear: DL is displayed on the mobile phone APP / computer. Low speed range to low speed line current ratio, low speed phase current ratio, and low speed limit.

2.2.1 Low-speed gear parameters

Low speed line current ratio, low speed phase current ratio, low speed speed.

2.2.2 Medium speed parameter

Medium speed line current ratio, medium speed phase current ratio, medium speed speed.

2.2.3 L DVOL

400-900, default 900, high speed idling noise matching parameters

2.2.4 L QVOL

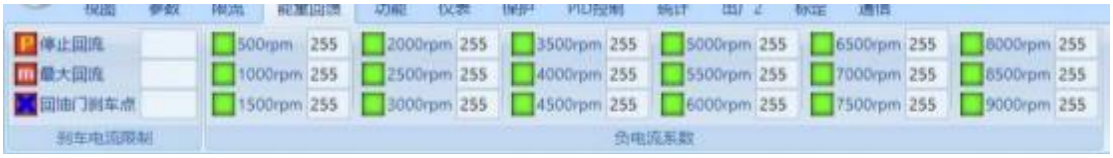
Intermediate throttle voltage (mV, VQH + 4 intermediate throttle enabled).

FAIF :

2.2.5

0~513	0	Starting resonance feature matching option 1 Note that when the vehicle motor performance is good, VQH + 64= 6 times speed Hall detection can further reduce the resonance noise.
	16~63	Starting resonance feature matching option 2
	64~256	General vehicle motor Hall characteristics
	384	Jump type car AB15 is easy to report an error when choosing 384 / 512.
	512	
	513	AB15 alarm in absolute encoder of CN controller. Other controllers: easy to AB15 error when used
+1024		The Fixed Bluetooth password is related to the product number

3. Energy feedback



For the return throttle brake function, in the riding process, back to the return throttle into the electronic brake state.

For the electronic brake function, when braking, the vehicle gives the brake signal to the controller, the controller detects the brake signal and then enters the electronic brake state.

Note When using the electronic brake function, you must select the electronic brake or the accelerator brake to enable this function. And set the reflux current. Note that the maximum reflux is generally 25%～50% larger than
the stop reflux.

3.1 Brake current limit:

3.1.1 Stop the reflux:

Brake current of the electronic brakes. The default 2A, when the electronic braking force is changed to 5A—20A. For the large capacity battery of four-wheelers, the reverse charging current can be larger,
which can be set to 20A—60A.

3.1.2 Maximum reflux:

Peak of electronic brake, brake current: default 4A, can be set to 10A- 40A when requiring a strong brake, and 40A—80A can be considered for
four-wheelers.

3.1.3 Back to throttle and brake point:

Default 0, under the throttle brake, above this speed, the turn back half is a uniform speed without acceleration nor deceleration state. For example, 4000 means that the higher the 0-4000 rotation speed, the more close to half the throttle value, and the intermediate throttle value above 4000 revolutions is a constant speed without acceleration or deceleration. Turn the acceleration above the middle value, below the
middle value, slow down, the more turn back, the more severe the brake.

3.2 Negative current coefficient:

The proportional coefficient of the reverse charging current is controlled at 500rpm, 1000rpm,..., 9000rpm.

The maximum coefficient is 0 and the minimum is-100. The closer the is to-100 the more negative current.

Ordinary two-wheeler, for about 400A controller, the negative current coefficient-10%~ -30% is enough. Other controllers are adjusted according to the situation. For driving safety, they can be adjusted from-10%. If not enough, then change to-15%, -
20%, do not suddenly set to-50%~ -100%, such an operation is easy to bring the danger of sudden braking. The old version controller has no negative current coefficient.

4. Function

4.1 Function input feet

4.1.1 BOOST: Select the BOOST function button input foot, the invalid selection will not be enabled

4.1.2 Cruise: Select the cruise function button input foot, select invalid, this function will not be enabled

4.1.3 P file: select P file function button input foot, select normal close will not enable this function

4.1.4 Forward: Select the forward gear function line input foot, which is not enabled

4.1.5 Back: Select the back gear function line input foot, which is not enabled

4.1.6 High speed: select high speed function line / button input foot, this function will not be enabled

4.1.7 Low speed: Select the low speed function line input foot, which is not enabled

4.1.8 Charging: Select the charging protection function line input foot, and the invalid function will not be enabled

4.1.9 Anti-theft: select the anti-theft function function line input foot, select invalid, this function will not be enabled

4.1.10 bucket: select the bucket function line input foot, when sitting, remove P gear after normal driving, otherwise can not drive.

If the implementation function is enabled, start the cart assist when not seated. Select the is selected to identify the sitting signal and implement function according to the VCU instruction. Invalid selection will not enable this feature.

4.1.11, speed limit: select the speed limit function line input foot, the invalid selection will not enable this function

4.1.12 Voltage switching: select the input foot of the rated voltage switching function line, and this function will not be enabled

Voltage switching foot =PIN 8 is the national standard speed limit of the voltage foot switching, the speed foot is specially defined

4.1.13 One-click repair: Select the one-key repair function line input foot, select invalid this function will not be enabled.

Note the selection switch When parking function, one key repair this foot as the switch of this function.

Note that except P may choose to close, other feet generally do not choose to close, otherwise affect the use of functions.

Description of the optional pin definition available here

option	A 6 / 12-tube NS series	Old model controller universal Hall interface	A 485 controller above 18G	YJCAN	Y JBMQ C AN	Old model encoder interface	remarks
normal close	normal close	normal close	normal close	normal close	normal close	normal close	
PIN 2	2 Foot						
PIN 3	Three feet	7 Foot	24 Foot	Three feet	Three feet	Three feet	

PIN 5	5 Foot	5 Foot	Three feet			5	The CAN version is not available
PIN 8	8 Foot	8 Foot	14 Foot	8 Foot	8 Foot		
PIN 9	9 Foot						
PIN14	14 Foot	17 Foot	18 Foot	2 Foot	2 Foot		
PIN15	15 Foot	4 Foot	2 Foot			4	The CAN version is not available
PIN17	17 Foot	30 Foot		17 Foot			The encoder version is not available
PIN18	18 Foot						
PIN24	24 Foot	25 Foot	15 Foot	24 Foot	24 Foot		
of no avail	of no avail	of no avail	of no avail	of no avail	of no avail	of no avail	

4.2 Special made function

4.2.1 High and low speed:

1) High speed only: only the high speed gear is required
2) Add or subtract: add or subtract the button
3) Point move high and low speed: point move 2 speed: high speed + low speed
4) High high speed: 2 speed: low speed + medium speed, (H 58 version)
5) Click three speed low: click 3 speed, default low speed
6) Click three speed: click 3 speed, default medium speed
7) Click three speed high: click 3 speed, default high speed
8) Click four speed low: click 4 speed, default low speed
9) Click four speed 2: click 4 speed, default 2 speed gear
10) Click four speed 3: click 4 speed, default 3 speed gear
11) Click four speed high: click 4 speed, default high speed
12) dial three speed: dial 3 speed
13) Serial port gear: serial port control gear, the default low-speed moped serial port instrument. XM ,
14) CAN gear: CAN control gear, default low speed gear
15) Invalid

4.2.24 Long press back:

When valid, you must long press the back button to switch to the back button. The default is invalid, switch back according to the back line.

4.2.34 gear:

Default forward, default neutral, invalid

4.2.44. Brake:

Brake function: do not pinch the brake can drive, disconnect the accelerator when pinch the brake.

Floating driving: pinch the high brake line to 12V or battery voltage. Or the low brake foot is connected to the battery ground. Note that the brake line signal is not isolated. When you do not pinch the brake, all 2 lines should be in a floating state.

Floating power: pinch brake, the car high brake and low brake 2 lines are floating. Do not pinch the brake, the high brake line is connected to 12V or the battery voltage, or the low brake foot is connected to the battery ground, note that the brake line signal is not isolated.

P + floating driving: in addition to the floating driving function, pinch the brake while lifting the P gear state. P +

floating power: in addition to the floating power function, pinch the brake while lifting the P state.of no avail:
Default floating air vehicle.

4.2.54 PC13：

Parameters of the old controller: floating driving, floating power off, floating cruise, grounding cruise, invalid. H-series controller parameters: normal response and track response.

4.2.64 Moss Code:

1) through the upper machine to change the Morse password can set 6 bits to open the speed, for 000000 does not limit, limit the speed for other passwords: each time when the boot must operate the Morse password to remove the speed limit.

2) Set the 7-bit Moss password is the speed limit switch, which is also the 6 digits after the operation, operating the speed limit conversion once: if the original speed limit state, it becomes a non-speed limit state, and vice versa. This conversion is saved inside the controller, and the boot is switched to this state.

4.2.74. Standing on the slope:

Hanging gear standing on the slope: when forward or backward, release the throttle will be standing on the slope, the gap is not standing on the slope, the steep slope slow descent function is invalid. P gear slope: in P gear state, set whether to enable steep slope descent function according to steep slope descent parameters in other states. Invalid: the standing slope function and steep slope descent function are invalid.

4.2.84. Follow-up:

Follow: The motor enables a certain idle speed

Invalid: shielded following and electronic brake

Electronic brake: start the electronic brake when pinching the brake.
Back to the accelerator brake: start the electronic brake back to the throttle

4.2.94 Slow descent of steep slope:

None: Do not enable steep slope slow descent.

1~7: The smaller the number, the slower the slow descent reaction, and the larger the number, the faster the slow descent reaction.

4.3 BOOS T

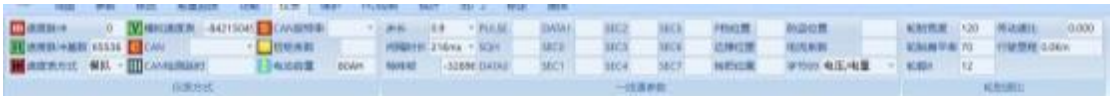
4.3.1 BOOS T duration:

BOOS T The default duration after startup is 45 seconds, and the maximum duration is 131 seconds;

4.3.2BOOST margin:

BOOST After the end, the interval required to start BOOST again, default 90 seconds, maximum 131 seconds;

5. Instrument



5.1, Instrument mode

The controller has 3 signal output feet, where

12 tube controllers and NS series controllers: 13 feet RXD, 18 feet ALAR M/SPD, 9 feet SPA

The old controller: 3 feet RXD, 9 feet SPD, 10 feet SPA, H series controller extension code will indicate the characters A~G

5.1.1 Speed pulse:

This value, 1-31, affects the pulse velocity output and the first-line pass velocity display. The larger the number, the higher the table display speed.

5.1.2 Velocity pulse base number:

Calibration base of the velocity pulse meter. Changing this value only affects the speed display of the speed pulse meter.
The hub default 40459, the middle default 26043

5.1.3 Vedometer mode:

Pulse / analog / isolation pulse

5.1.4 Simulation meter:

Phase line instrument voltage indicates the speed of the instrument using the coefficient, the adjustment of this coefficient can change the speed of the display.

5.1.5 CAN :

Instruction number, Hxx version default 60, the previous version according to the agreement, different instruction number

5.1.6 CAN Detection Delay:

Default 150ms Individual customer requirement 1900ms

5.2 First-line communication parameters

One-line display pay attention to the pin is not wrong: 12 pipe below generally choose 18 foot one line, individual drive shared configuration with 13 foot one line. NS series 18 tubes above the same as 12 tubes.18 tubes above the old version of the controller generally 9 feet one line.

5.2.1 step:

Most of the first lines are 0.5 or 0.9. Default is 0.5, optional 0.9,1.2,1.9

5.2.2 Interval duration:

Most of the first-line pass support 55ms, default 55ms, optional 24 ms, 144 ms, 216ms;

5.2.3 PULSE :

Default 0, custom time non-0

5.2.4 SQH :

Default 0: custom time non-0

5.2.5 Special Frames:

The following 0-255 define special frame types.

	Special frame	explain
1	0~1	Non-first-line 0: Speed pulse, (display adjustment: the larger the speed pulse base, the slower the display speed

<table>
<tr><td></td><td></td><td>500~65530, V39 and previous versions are 5000~65530)
1: READY lamp: (READY state is high output, otherwise output is low)
2: Fan control: (temperature below 40° is high output, and higher than 40° is low output)
3: Special serial port command BF_ZHULI
4: Special serial port command ZHULI power pulse detection (PIN 3)
5: Special serial port instruction KM5
6: Special serial port instruction UK1
7: Special serial port instructions
Step length, interval length, PULSE =0, SQH = 0, DATA 0-DATA 1, and SEC 0-SEC 7 is invalid</td></tr>
<tr><td>2</td><td>16~31</td><td>General line 2
Different instruments, DATA 6 / DATA 9 / DATA 10 should send different content, refer to the communication protocol selection to first content:
DATA 6: byte option =3 when output 0, otherwise output current value.
DATA9 Option: 0 voltage-1～255V, 4-power, 8 voltage 0.5V, 12-according to the byte option, as follows:
Byte option 0: nominal voltage rule 0
Byte option 1: nominal voltage rule 1
Byte option 2: nominal voltage rule 2
Byte option 3:0
DATA 10 Option:
0 Power, 1-current percentage, 2 voltage 1～255V,
3-According to the byte options: as follows
Byte option 0: nominal voltage rule 0
Byte option 1: nominal voltage rule 1
Byte option 2: nominal voltage rule 2
Byte option 3:0
Special frame =16 + DATA 9 option + DATA 10 option, general first-line pass =21
<table>
<tr><td>parameter</td><td colspan="6">List 6 sets of parameters. Different first-line instruments have different parameters, and the first set of parameters is commonly used</td><td></td></tr>
<tr><td>parameter group</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>PULSE</td><td>0</td><td>0</td><td>0</td><td>0</td><td>10</td><td>0</td><td>0</td></tr>
<tr><td>SQH</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>DATA0</td><td>(8)
0x08</td><td>(89)
0x59</td><td>(24)
0x18</td><td>(3)
0x03</td><td>(16)
0x10</td><td>(81)
0x51</td><td>(16)
0x10</td></tr>
<tr><td>DATA1</td><td>(97)
0x61</td><td>(66)
0x42</td><td>(2)
0x02</td><td>(1)
0x01</td><td>(18)
0x12</td><td>(0)
0x00</td><td>(149)
0x95</td></tr>
<tr><td colspan="7">The step length is 0.9ms, the interval length is 144ms, some need 216ms SEC 0~SEC 7 default full 0</td></tr>
</table>
It's normal,</td></tr>
<tr><td>3</td><td>32~40</td><td>No one line through, built-in Bluetooth
Special frames: 32-TBIT, 33-XZ_CONTROL , 34-XMZSBXX , 35-XM 3SPEED , 36-M2S , 37-CN
Step length, interval length, PULSE =0, SQH = 0, DATA</td></tr>
</table>

		0-DATA 1, and SEC 0-SEC 7 is invalid
4	48~223	Encryption first-line communication, the internal SEC Different instruments, DATA 6 / DATA 9 / DATA 10 should send different content, refer to the communication protocol selection to first content: Base = 48 64 80 96 112 128 144 160 176 192 208

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	。

DATA 6: byte option =3 when output 0, otherwise output current value.
DATA9 Option: 0 voltage-1～255V, 4-power, 8 voltage 0.5V, 12-according to the byte option, as follows:
Byte option 0: nominal voltage rule 0
Byte option 1: nominal voltage rule 1
Byte option 2: nominal voltage rule 2
Byte option 3:0
DATA10 Option: 0 power, 1-current percentage, 2 voltage 1～255V, 3-according to the byte option, as follows:
Byte option 0: nominal voltage rule 0
Byte option 1: nominal voltage rule 1
Byte option 2: nominal voltage rule 2
Byte option 3:0
Special frame = base + DATA9 option + DATA10 option
Recommended step length 0.9ms, interval length 144ms, some need 216ms to normal,
PULSE =0,SQH =0。DATA 0-DATA 1, SEC 0-SEC 7
SQH remains invalid at SQH = 255 (specific protocol requirement-H43 version)

5	224~239	Encryption first-line communication, the external SEC DATA 6: byte option =3 when output 0, otherwise output current value. DATA9 Option: 0 voltage-1 ~ 255V, 4 power, 8 voltage 0.5V, 12-according to the byte option, as follows: Byte option 0: nominal voltage rule 0 Byte option 1: nominal voltage rule 1 Byte option 2: nominal voltage rule 2 Byte option 3:0 DATA10 Option: 0 power, 1 current percentage, 2 voltage 1 ~ 255V, 3-according to the byte option, as follows: Byte option 0: nominal voltage rule 0 Byte option 1: nominal voltage rule 1 Byte option 2: nominal voltage rule 2 Byte option 3:0 Special Frame =224 + DATA9 option + DATA10 option Professionals, all parameters can be modified: The step length is 0.9ms and the interval length is 144ms, and some need 216ms to be normal. PULSE, SQH, DATA 0-DATA 1 and SEC 0-SEC 7 can be modified.
6	240~255	Special frame: 241: ATN 15 byte (PULSE, SQH, DATA 0-DATA 1, SEC 0-SEC 7 invalid) 242:30, P in DATA 4

243: One-line pass: 0x52,0x51
244: F2 first-line, SEC 0 = 0 means F0, and other numbers means F2
245: the synchronous output of the alarm lamp,
246: when using the 485 interface must be special frame =246 convenient computer 485 connection
247:15 byte line, SQH remains invalid at SQH = 255 (specific protocol requirement-H43)
248:13 byte line, SQH remains invalid at SQH = 255 (specific protocol requirement-H43)
249-NOSQH,
250-YJ line pass, SEC 0 = 255 allows 24 feet to select pulse / pass
251-PD0 detection, first-line communication,
252-PA15-detected first-line access
253: DY line,
254:485 without Bluetooth

All of the parameters can be modified.

parameter	parameter group,							
Parameter group code	31	26	5					
step	0.9	0.9	0.9					
The 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 gear position	3	1	1					
Side support position	2	1	8					
Turn the position	0	8	8					
Anti-theft position	8	0	8					
Current coefficient	64	64	64					
Byte option	3	3	3					

Byte option 0 1 2 3				
DATA6	0	current	current	current
DATA9	0 Voltage	quantity of electricity	quantity of electricity	0
DATA10	quantity of electricity	Percentage of current	voltage	0

P gear position	0-3: The BIT location for Byte 2 8: Do not show. 11: BIT Position 3 for byte 4 (H40 added) 13: byte 2=0x0a / 0x08 (H40 increase) 14: Bytes 2=0X0E (H40 added) 15: Byte 2=1 / 8 switch (H40 added)	
Side support position	0-3: The BIT location for Byte 2 7: BIT 7 for byte 3 8: Do not show.	
Turn the position	0-3: The BIT location for Byte 2 8: Do not show.	
Anti-theft position	0-3: The BIT location for Byte 2 8: Do not show.	

5.2.6 Description of SPA output signal:

1	Special frame <16	Output analog voltage
2	Special frames are of> =16, and the OBD is valid	Do the OBD alarm light indicator for use

3	Special frame> =16, OBD is invalid, the new national standard overspeed prompt is valid	Output high pressure at overspeed
4	Special frame> =16, OBD is invalid, the new national standard overspeed prompt is invalid	When there is an alarm, output the alarm pulse. When no alarm, P, gear output voltage

5.2.7 DATA 0:

HEAD defaults to 8, and customize with other values

5.2.8 DATA 1 :

HEAD 2, default 97, =0 from SEC 0 to SEC 7

5.2.9 SEC 0~SEC 7:

Default: 0, custom = non-0

5.2.10 P-gear position:

0-3: The P file is in the BIT position of byte 2

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

8: P gear does not display.

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

13: P, file in byte 2=0x0a / 0x08 (V40 added)

14: P, file in byte 2=0X0E (V40 added)

15: P, switch at byte 2=1 / 8 (V40 added)

5.2.11 Side support position

0-3: Support in the BIT position of byte 2

7: BIT 7 supported on byte 3

8: Side support does not display.

5.2.12 Transfer position

The internal control display bit (0~3, default 3), if not set to 8

5.2.13 Anti-theft position

Anti-theft indication display bit inside the first line (0~3, default 8), if not set to 8

5.2.14 Current coefficient

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

5.2.15-byte options

0, 1, 2, 3: Contact the remote drive adjustment parameters

5.2.16 First-line commissioning

Most of the first line on the market default 21, byte option =3 situation basically can show the speed, some meters can not show. In the case of not knowing the protocol, the step length is 0.9 ms and the interval length is 216 ms. Try to see if there is feedback from the meter:

1) Try the special frame 16 first, the byte option =3,

2) Try parameter group 1 first: PUSLE = 0, SQH = 0, DATA 0 = 8, DAT A 1=97.

3) Try parameter group 2: PUSLE = 0, SQH = 0, DATA 0 = 89, DATA 1 = 66.

4) If not the general rule parameter, other parameter groups. See the following table for more details.

5) If all parameter groups are invalid, enter 3.2.

6) If the special frame 16 does not respond, it changes to 16,32,48,64,80,96,112,128,144,160,176,192,208.

7) Generally try to the above special frame can find the right line, according to the details voltage, power display is small modified special frame

can meet the requirements: such as find 48 speed can normal display, and voltage or current display is wrong, you can try to modify the special frame between 48~63 number to correct. For example, if you find that 160 speed can be displayed normally, but the voltage or current display is not right, you can try to modify the number between the special frame 160 and 175 to correct. If the P display is not accurate, the P position can be modified to meet the display requirements.

8) If the above operations cannot be displayed correctly, consider the step length of 0.5ms and try again in step 3.1-3.3.

9) Do not show any of the above operations. Consider the special frames 247 or 248.

10) If the above does not work, you need to contact the remote drive to analyze other special frames of 224 or 240~255

5.3 the tire speed ratio

Note that to set correctly, the speed mileage calculation will be correct.

5.3.1 Tyre width

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

5.3.2, tire flattening rate

Take 120 / 70 / R12 for example, tire flattening rate =70

5.3.3 Wheel hub R

Take 120 / 70 / R12 as an example, the hub R =12

5.3.4 Transmission speed ratio

When the pole log of the Hall version hub motor =20, the transmission speed ratio =20 / 5=5 is calculated according to 4 pairs of poles

5.3.5 Mileage traveled

Total mileage of the controller driven.

6. Protection

6.1 Voltage protection

6.1.1 Over-pressure protection, recovery,

The interior is set according to the rated voltage

6.1.2 Undervoltage protection and recovery

When the battery voltage is close to the undervoltage protection point, the controller reduces the power output, so that the battery will not be too discharged and damage. General battery undervoltage is set as follows:

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

6.1.3 Under-pressure mode

2V: the power drops when is more than 2V higher than the undervoltage point, and the power drops begins when reaching the undervoltage point + 2V.4V: the power drops when is more than 4V higher than the undervoltage point, and the power drops begins when reaching the undervoltage point + 4V.8V: the power drops when is more than 8V higher than the undervoltage point, and the power drops begins when reaching the undervoltage point + 8V.12V: when the undervoltage point is more than 12V, and reach the undervoltage point + 12V.16V: when the undervoltage point is more than 16V, and reach the undervoltage point + 16V.

Turtle speed power 5%: battery capacity is less than or equal to 20% reduced power, less than or equal to 5% using turtle speed home. Turtle speed power 6%: battery capacity is less than or equal to 30% reduced power, less than or equal to 6% using turtle speed home. Turtle speed power 7%: battery capacity is less than or equal to 40% reduced power, less than or equal to 7% using turtle speed home. Turtle speed power 8%: battery capacity is less than or equal to 50% reduced power, less than or equal to 8% using turtle speed home. Turtle speed power 9%: battery capacity is less than or equal to 60% reduced power, less than or equal to 9% using turtle speed home. Turtle speed power 10%: battery capacity is less than or equal to 70% reduced power, less than or equal to 10% using turtle speed home. SOP value: Limit the power against the maximum allowable line current SOP value received by the BMS / CAN bus.

other:

6.2 Temperature protection

6.2.1 Temperature protection and recovery of the motor:

Internal setting

6.2.2 Controller temperature protection and recovery:

Internal setting

6.3 Functional protection

6.3.1 Transfer control is missing alarm:

Effective / invalid

6.3.2 Throttle plug and plug protection:

1 means that the throttle insertion and pull will cause the protection to prevent the car caused by live plug and pull, 0 means no protection.

6.3.3 Back to P free time:

Default is 10 seconds

6.3.4 Block delay:

Default is 1 second

6.3.5 Blocking rotation time:

Unit is 0.1 seconds, setting 50 is 5 seconds.

6.3.6 Parking time:

Default of 0.1 seconds, maximum of 132 seconds;

6.4 Battery protection

6.4.1 0 Electric quantity coefficient:

Calibrate the parameters of the 0 charge display.

The controller itself can estimate the battery power, and can obtain a more accurate power display by adjusting the 0 power coefficient and the full power coefficient.

When the battery is full, adjust the full coefficient so that the display capacity is just 100%.

When the battery power is dead, adjust the 0 power coefficient, so that the display capacity and power are basically consistent. For example, when you have 10% of the power left, adjust the zero power coefficient so that the power display is just 10%.

6.4.2 Full power coefficient:

Calibrate the parameters of the full charge display.

6.4.3 Speed-limiting starting power quantity:

The starting electric quantity of the electric speed limit algorithm

6.4.4 Speed limit limit power:

The limit minimum power of the speed limit algorithm

6.4.5 Speed limit limit coefficient:

According to the limit coefficient of the electric quantity speed limit algorithm

6.4.6 Current limiting coefficient:

The default speed current limiting coefficient is 53, speed current = user maximum current * speed current coefficient / 2048; 6.5

6.5.Battery characteristics

6.5.1

Battery signal source

option	content	explain
0	ISDN	SOC of the battery through first-line communication
1	gorge line	The SOC of the battery is obtained by the serial port
2	C AN	By CAN, through access, the SOC of the battery
3	lithium cell	The SOC is simulated by calculating the characteristics of the ternary lithium battery
4	plumbic acid	Simsimulated SOC by lead-acid battery properties
5	Lithium iron (H 72)	Simulated SOC is calculated by using the characteristics of the lithium iron phosphate battery

6.5.2 Current electricity

Displays the current battery power level.

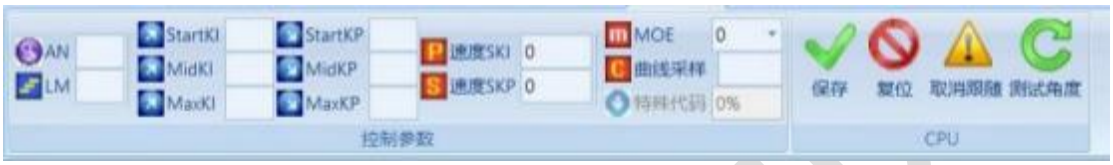
6.5.3 internal resistance of cell

Base value: 0~255, default 8

	function		
+256	Measure the second throttle / brake voltage	Do not add	Check the electric door lock voltage
+512	PD protocol	Do not add	OP protocol
+1024	Agreement 2		
+1536	Agreement 3		
+2048	Agreement 4		
+2560	Agreement 5		
+3072	Agreement 6		
+3584	Agreement 7		

+4096	8 times PID, ordinary users do not change, otherwise easy to damage the controller		Current sensor type> =2 is not supported
+8192	2 X PID		Current sensor type> =2 is not supported
+12288	4 x PID		Current sensor type> =2 is not supported

7 The PID control



7.1 A N ：

AN value of motor body property, parameter range 0~16.
Standard table, stick to motor AN=0. Standard IPM motor AN=16.
This parameter must be set according to the motor characteristics. Hub motor, table center motor,
The AN is less than 8. The AN value of the embedded middle motor is not less than 8. Coding coordinated with the remote drive
Medium motor and automotive permanent magnet synchronous motor, all adopt AN =16.
All the hub motors on the market belong to the table stick motors, and the AN value is generally set to 0,
Not more than 4. The AN value is not set correctly, which will lead to low start efficiency,
The MOE / OVER protection even appears.

7.2 LM：

Vehicle motor acceleration matching parameter, this value is used to adjust the operation fluency of the motor on the vehicle. The default is 22 and the electric default is 18.
Some small-power tricycles under 10 are more appropriate.
However, there are some motor types and the vehicle matching is very poor, starting low speed section, the medium speed section will feel obvious resonance shaking. Adjusting the LM values will improve.
Start from 22, if the low speed acceleration jitter, reduce LM, from 16,14,12,11,8,5 to test the effect, the middle of the numbers will also work, generally consider rather larger, try not to be too small. Too small will not control the current, cause MOE / OVER protection, and even burn control. So when the jitter disappears, the LM value is the best parameter, do not tune it down.
Some motors and vehicles are very smooth when LM = 22, but they will bring jitter after change, so we should note not to adjust this parameter if there is no problem with LM = 22.
Or found jitter resonance occurrence after the LM values from 22 16,14, Even 5 doesn't have much effect, but it has nothing to do with this parameter, so it is important to change back to the maximum value, such as 22, instead of keeping a number in the controller.

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

The default parameters are StartKI=4, MidKI = 8, MaxKI = 12 / StartKP=40, MidKP = 80, MaxKP = 120.

The higher the motor power, the higher the voltage, and the smaller the PID. PID parameters can not be filled in, otherwise it will lead to abnormal work or even burn control. The following are the common PID setting parameter values. A total of 9 sets, one of the parameters are selected to match the motor vehicle, modified under the guidance of professionals.

	StartKI	MidKI	MaxKI	StartKP	MidKP	MaxKP	
1	1	1	1	10	10	10	Surf board 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 motor
7	6	7	10	60	70	100	
8	8	8	12	80	80	120	Small and medium power default
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	

Note that the improper setting of PID parameters will cause the system to work abnormally, or even appear MOE / OVER / PHASE failure, the difference is too big to cause fire control, we should pay special attention to it.
Note that some low-power motor PID parameters exceed the controller debugging range, this case Please contact the remote drive to solve it.

7.4 Speed SKI, SKP

SKI minimum 1, maximum 18, heavy KI=18, light KI=2, default KI=9, SKP 5 to 20, with a default value of 10

7.5 MOE

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

7.6 Curve sampling:

With ms unit interval sampling, the Hxx and above acceleration curve has 7.72560 points, and the following acceleration curve has a total of 510 points. For example, set 100ms sampling, then the acceleration curve is 510 points, and the total time is 256 seconds / 51s

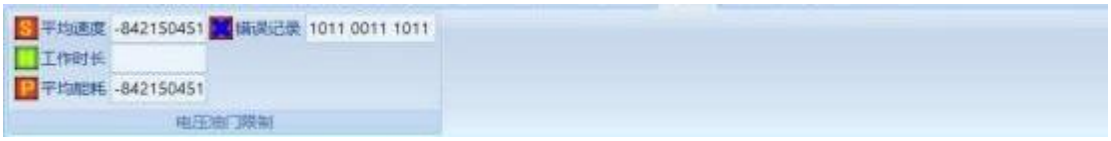
7.7 Special code

Normal code version	Special code	edition	Special code
The Hall Speed 128 Common Edition	1	8 x the PID	+8
The Hall Speed 256 Tap version	2	Check the brake voltage	+16
Hall Speed 384 general jump version	3	The old controller	+64
Hall Speed 512 Jump Edition	4	RS 485	+128

Specific SERIAL8	+256	Specific SERIAL12	+512
Specific SERIAL16	+1024	High- speed version	+4096

8 statistics:

The Hxx version is valid



8.1 Average speed: the current average speed
8.2 Working hours: total working hours
8.3 Average energy consumption: the current average energy
8.4 consumption Error record (retained)

9 Factory-2

9.1 Front and rear teeth ratio:

The default ratio is 64, the set point is 64 is 1 to 1,128 is 2:1,32 is 0.5:1.

9.2Positive and negative transition speed ratio:

A parameter required for the forward and reverse gear transmission system.

9.3 Voltage selection factor:

The the to of the operating voltage

For exa mpl e, the 72V sys tem , aft er the vol tag e sel ect ion pin is low , becomes a 60V system wit h its coefficient = 60 / 72 * 128 =10 7

9.4 Torque coefficient

Range 256 to 16384, default 8192

9.5 Weak magnetic current coefficient

Range of 48 to 80, with a default value of 64

9.6 backward acceleration coefficient:

The maximum acceleration coefficient default 32 and maximum 224

9.7 alarm delay:

The recovery delay time is set when the burglar alarm generates an alarm. The default 500ms selects a multiple of 100.

Single-digit use: 1~9 indicates unbraking within 100 RPM ~ 900 RPM.0 means that all the brakes respond.

Ten digit number (H59)	First-line communicatio n display	When the READY lamp turns	First-line-pass electronic brake status (H60)
0	Brake state	go out	show
1	Brake state	go out	blank
2	Brake state	bright	show
3	Brake state	bright	blank
4	Brake fault	go out	show
5	Brake fault	go out	blank
6	Brake fault	bright	show
7	Brake fault	bright	blank
8	Brake state	go out	show
9	Brake state	go out	blank

9.8 Relay delay:

Set the delay closing time of relay after system power on: ms is unit, the default 1ms is set to 1000ms, etc. Note H44 new controller all changed to functional bit:

position	project	function declaration
BIT0	While the support is enabled	0: Disable the edge support function, 1: Enable the edge support function, default 1
BIT1	The bucket is enabled	0: Disable seat cushion function, 1: Enable seat cushion function, default 1
BIT2	P file enabled	0: Disable P function, 1: enable P function, default 1
BIT3	self-recovery P	0: Disable automatic return P function, 1: enable automatic return P function, default 0
BIT4	Cruise enabled	0: Disable cruise function, 1: Enable cruise function, default 1
BIT5	EABS start using	0: Disable the EABS function, 1: Enable the EABS function, default 1
BIT6	Implementation enabled	0: Disable the power implementation function, 1: enable the power implementation function, default 1, enable the implementation, will automatically cancel the P file entry implementation mode
BIT7	Forced anti-theft	0: No mandatory anti-theft, 1: forced entry anti-theft, default 0
BIT8	Overspeed alarm	0: Disthe overspeed alarm function, 1: enable the overspeed alarm function, default 0
BI T9	Brake don't understand parking	0: the brake will remove the parking, 1: the brake will not lift the parking, default 0
BIT10	Block memory	0: gear memory off 1: gear memory valid default 1
BIT11		Default 1
BIT12		Default is 1
BIT13		Default 0
BIT14	Back enabled	0: Disable back function, 1: Enable back function, default 1
BIT15	Relay delay	0: no relay delay, 1: delay of 1 second, default 0

Relay delay =BIT 15 * 2 ^ 15 + BIT 14 * 2 ^ 14 +... + BIT 1 * 2A1 + BIT0;

9.9 Slow start:

Default 512

9.10 Follow the speed:

Default 0, some customers need to exit to follow within 100 turn, set 100

9.11 Current anti-theft,

Default 0, anti-theft to provide greater resistance is difficult to push, do not consume the battery. At 1, the anti-theft lock motor will lock the electricity

The machine does not turn and consumes the battery.

9. 12 Anti-theft pulse:

Default 0	Anti-theft signal is the level signal, pull down the anti-theft.
1 (Overspeed alarm =0)	Anti-theft signal is 1 mS pulse signal, with a pulse is anti-theft
1 (Overspeed alarm =1)	Pulse is the national standard data, the low level is anti-theft.
2	Power-on speed limit, 8 pulse signals to remove the speed limit

temperature 70:

Controller temperature protection 70 algorithm:

0 means that 50° starts starting control, protecting the life of the battery, the controller, and the motor and extending the range.1 means that the 70° starts starting control, battery, controller, motor temperature is considered in the mileage and performance discount.

3 means that 80° starts to start control, performance is preferred, but the shortest mileage, and rapid acceleration is the most likely to cause overtemperature protection.

9.13 Reverse Time:

Time to start slow drop during reversal, 12-48, default 36.

9.14 Slow slow speed:

The critical value of slow speed on steep slope is 320 to 256~1024

9.15 Slow reduction coefficient:

Default 2, can be set to 1-7, the larger the number, the slower the slow drop speed, note that the number is too large, the gear gap will shake. The smaller the number, the faster the slow-drop speed.

9.160-Speed Switch:

Switswitching is allowed when speed equals 0

9.17 Deep weak magnetic field:

In the case of battery internal resistance special value (please consult the remote drive), the deep weak magnetic (a motor factory absolute encoder motor special special) can be set to 1= effective. Otherwise the automatic return to 0= invalid.

9.18 RS485 Agreement:

Extension code = "X": protocol control under RS485 state, default RS485 instrument, in the computer, will automatically enter the communication mode with the upper computer.

0: BMS protocol control for OEEMS YJ

1: VCU protocol for OEMs PD and OP

2: VCU protocol control for OEEMS DP2

3: xxxVCU protocol control for OEMs

4: For the oEMS.……。

5: TUYA control for OEMs

9.19 Serial port sharing:

Manufacturer set value, do not allow users to change.

	gorge line	explain
1	Don't share	RXD specialized user serial port debugging and upgrade use. The SPD pin is used to output the speed pulse and first-line pass signal.
2	Pull up to share	Old version controller, YJCAN interface board
3	Drive sharing	12-tube and NS series.
4	RS485	nonshared control unit.485 Interface

9.20 AutoLearn throttle:

Default 24, maximum 36, note that the motor is required in the no-load state. Normal motor when starting AutoLearn 24 throttle is enough, a small part of the motor can not turn up, increase the throttle to 36 to start the motor. If the AutoLearn motor does not rotate, it is likely that the Hall line is wrong or the phase line is not connected in sequence. Check the Hall wiring, or adjust the blue and green line alignment and try again.

AutoLearn throttle =23,24,25,26,27 corresponds to different idle strengths.23 were the weakest, and 27 were the strongest.

9.21 AutoLearn voltage low VQL:

Base default value 18432, base wide range value =25856, normal default value.

value-added	function		
+1	Start the idle clutch function (H67)	Do not add	Do not start the clutch function
+2	Voltage pin =P I N 8 at the time of: (H72) PIN 14 foot grounding soft start, PIN 8 grounding 60V, suspended 48 / 72V voltage automatically switch	Do not add	When the voltage pin = PIN 8: PIN 8, PIN 14 double line selected electric press
+4	Reverse neutral gear is the ignition switch (H72)	Do not add	Normal reverse neutral function
+8	Knob adjusting maximum bus bar (H72)	Do not add	normal mode
+16	One-click repair foot switches half of the current (H72)	Do not add	No switch
+32	P (H72)	Do not add	normal P

+64	Press the P first, and then pinch the brake to remove the P (H72)	Do not add	normal P
+128	Single battery does not allow BOOST (H74)	Do not add	normal BOOST

9.22 AutoLearn voltage high VQH:

Base default: 24320, base wide range =31744, normal default value.

value-added	function		
+1	Tap to move forward and backward (H67)	Do not add	Switch forward and back
+2	Dual-throttle voltage (H72)	Do not add	Single throttle
+4	Intermediate throttle neutral (H74)	Do not add	Normal throttle
+8	One-Click Repair Is Effective (H72)	Do not add	One-click fix doesn't work
+16	Strengthen the input signal filtering (H72)	Do not add	Normal input filter
+32	Cruise speed is not limited, the implementation of acceleration control (H72)	Do not add	Cruise limit to 3 / 4 of the maximum speed, the slowest implementation
+64	Six-Speed Hall Test (H72)	Do not add	Haplovelocity Hall detection
+128	New MTPA vector (H73)	Do not add	Conventional MTPA vector

10 The calibration

10.1 Voltage:

Displays the input voltage of the controller

10.2 Calibration times:

Displays the number of controller parameter modification

11. Communication

11.1 Communication serial port

Port: According to the user's computer situation, check the COM slogan selection in the device manager.
Paud rate: fixed 19200.

11.2 Software upgrade:

Only upgrade the code without changing the parameters.

11.3 Brush machine:

Upgrade the code and reset it to the parameters brought with the program. Note that the HXX version of the data is empty but no customer data, but also need to use the HEB file to download the data to the controller.

11.4 Operation

AutoLearn: Start the AutoLearn
Cancel AutoLearn
Save: save data to the controller, the next reset start with new data work.

11.5 Product No

Controller internal product number: Controller unique number, used for product
registration and password retrieval.

11.6 Region, control type: reserved

11.7 Login:

The build version software can set a 30-bit password so that the controller can only modify the parameters if it enters the password. Controllers of ordinary models have no password, etc. Some model controllers set a 30-bit password according to the requirements. After setting the password, users can only view the parameters and status. Click Login and enter the correct
30-bit password before modifying the parameters.

11.8 Restore the factory

Restore the internal parameters of the factory program BIN file.

12. Data copies:

Batch viewing and adjustment of controller data and CAN bus data,
Adapted to the Hxx and above versions:

12.1 Obtaining the controller data:

1) Batch download parameter button on the right: open the batch download parameter window., Click " to get the controller data ".
2) The CAN protocol format parameters inside the controller can be displayed in the dialog box.
3) Click the Cancel button and return to the main menu.
4) Click the main icon in the upper left corner, select save as heb file, and can save your own controller parameter file.

12.2 Download the heb data:

1) Connect the controller, open the upper computer computer, click the main icon in the upper left corner, and select to open a "heb" file (such as GX 72400_13_A. Heb), the dialog box pop up.
2) Click "download data to the controller", you can see the matching progress bar gradually full, and the controller will prompt the alarm sound and point
"Controller writes and reset", the controller data works as new data.
3) Click to cancel and exit the dialog box.

12.3 CAN Agreement data:

12.3.1 CAN control

12.3.1.1 Data format:

1) CAN data field information byte location diagram:

	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 the sending order:

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, selected according to the protocol requirements.

2) INTEL format: small-end mode.

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

Example of a physical transformation:

Speed = 4000 RPM, physical signal value = precision * signal logic value + offset, precision =0.25, offset =0;

Then 16 x is 0x3E80 (16000d), with the message BYTE 1 = 80 H and BYTE 2 =

3 EH

3) MOTOROLA Format: Large-end mode:

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

Example of a physical transformation:

Speed = 4000 RPM, physical signal value = precision * signal logic value + bias, precision =0.25, bias =0; 16 base is 0x3E80 (16000d), message BYTE 1 = 3 EH, BYTE 2 = 80 H

12.3.1.2 Receiving Frame Type:

Optional standard frames, extended frames

12.3.1.3 Send Frame Type:

Optional standard frames, extended frames

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

BMS maximum allowable discharge current value, indicated in 2 bytes. SOP _ID: The ID number of the SOP instruction.

SOP units: generally set to 0.1A, but also set to 0.25A, or 1A. SOP high-byte position (0-7 for BYTE 1-BYTE 8)

SOP low-byte position (0~7 corresponding to BYTE 1-BYTE 8)

SOP value = (value of SOP high byte position * 256 + value of SOP low byte position) * SOP unit (A).512.3.1 SOC _ ID, SOC location.

Current power percentage value of BMS, full power =100, no power =0. SOC _ ID: The ID number of the SOC instruction.

The SOC position: 0-7 corresponds to the BYTE 1-BYTE 8.

12.3.1.6 Charging ID, charging byte position, and charging BIT position.

Charging ID: the ID number of the charging command.

When both the byte position and the BIT position are 0, stop with any ID number.

When the position is not 0, stop when the position is 1.

12.3.1.7 Supporting ID, byte position and BIT position

Side support ID: the ID number of the side support command. The support is not allowed to drive 1, the support can be driving 0.

Under the dual-power system, this ID is the charging and anti-driving ID of the second battery, and the content is the same as 12.3.1.6

12.3.1.8 Three-speed ID, three-speed byte position, three-speed BIT position

Three-speed ID: the ID number of the three-speed command.

There are two bits in three speeds, 0 means 1 gear speed, 12 gear speed, 2 three gear speed, and 34 gear / boost speed. The three-speed low position is at the specified BIT position and the high position is at the BIT + 1 position.

12.3.1.9 Block ID, byte position, and BIT position

Shift ID: the ID number of the shift command. Note the use of gear control, backward is also fast.

There are 2 bits in total, 0 indicates N, 1 forward and 2 backward. The low position is at the specified BIT position and the high position is in the BIT + 1 position.

12.3.1.10 Control ID, control type, control byte position.

Control ID: The ID number of the control instruction.

Control Type:

project	==1	==0
BIT0	+ 1: Unmanned driving display	+ 0 Other items are displayed
BIT1	+ 2: Serial number	+ 0 Error record
BIT2	+ 4: Low speed / high speed separate display	The + 0 normal three-speed display
BIT3	+ 8: Number of circles are displayed	The + 0 shows the total mileage
From BIT 6 to BIT 4 special controls	0= + 0: driverless 9 3= + 48: driverless 59 6= + 96: Dual battery system 7= + 112: Dual battery system TCS ID	1= + 16: ZN / YJ Calculate SOC based on the remaining battery capacity of BMS 2 = + 32: Total mileage handshake 4= + 64: on-demand feedback 5=+80:TCS -I D
BIT7	= + 128 shows the current mileage	Displays the remaining mileage

On-demand instructions: 12,13,14,15 correspond to sending ID 2, ID 3, ID 4 and ID 5 respectively

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

12.3.1.11 OBD_ID

The ID number of the OBD, and the standard frame is a 7DF,

12.3.2 CAN Send ID

The controller is set up with 6 ID numbers to send the data.

Send ID 0 timing ~ Send ID 5 timing is a timing count in 10ms, 0 means 10ms, 120ms, 230ms. 199 2000ms.

Send ID 2 timing ~ Send ID 5 timing must be> =4 namely 50ms. Less than 4 is sent as demand according to instructions received by CAN.

12.3.3 Description of the CAN Rules:

CAN sending includes 21 data, 17 states and 14 alarm messages. Each content includes the following definitions: 12 Length:3.3.1

Is the number of BIT required for this data. For example, speed, current, voltage is generally 16, gear is 2, alarm state is generally 1.

12 Position.3.3.2

For the position of this data LSB in the CAN frame, look at the previous "CAN data field information byte location map". 12 Gain.3.3.3

Coefficient of * as required for this data. Default gain =1

1) Customer code, serial number, hardware version, software version: Gain =1
2) Current voltage unit is 0.1V, gain =1
3) The current current unit is 0.1A, with gain =1
4) Current phase current unit is 0.1A, gain =1
5) Throttle opening degree, gain =1
6) The throttle voltage unit is 0.01V, with a gain of =1
7) Current torque unit = 0.1 Nm, gain =1
8) Current speed, gain =1
9) Current speed unit =1 RPM, gain = 1
10) Total mileage is 16 bits high, unit = 0.1 Km, gain =1
11) Total driving mileage is 16 bits lower, unit = 0.1 Km, gain =1
12) Unit of current mileage = 0.1 Km, gain =1
13) Controller temperature, in °, gain =1, bias =40
14) Motor temperature unit °, gain =1, bias =40
15), battery power, in unit%, gain =1
16) Status and alarm: Gain =1

12.3.3.4 ID

Serial number of the data sending ID (0~5, corresponding to CAN sending ID 0 ~ CAN sending ID5)

12.3.3.5 Effective mark

Valid: This data is reported to the CAN bus at the specified BIT and BYTE location.

Invalid: This data is not reported to the CAN, on the bus.

12 bias in affine function.3.3.6

Temperature offset 40, other default offset =0:

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

12.3.4 CAN data

A total of 21 data, users can either report or not report:

project	content	The default value
1	customer code	It consists of two letters
2	Serial number 0	16 Numbers

3	Serial number 1	16 Numbers
4	Serial number / error code	16 bits: display according to the control word
5	Hardware version	Eight
6	Software version 0	Eight
7	Software version 1	Eight
8	voltage	16 The
9	current	16 The
10	phase current	16 The
11	Throttle opening / control data	8 / 16-bit, driverless project showing control data
12	Throttle voltage / control command	16-bit, driverless items display control instructions
13	torsion	16 The
14	The current speed	16 The
15	Current speed	16 The
16	Total mileage / lap count is 16 bits high	16 bits: display according to the control word
17	Total mileage / lap number is 16 bits lower	16 bits: display according to the control word
18	Current mileage / remaining mileage	16 bits: display according to the control word
19	Controller temperature	Eight
20	Motor temperature	Eight
21	Current electricity	Eight

12.3.5CAN state:

17 states, users can report or not report:

project	content	The default value
1	Block status	Two SEC 3 = 1: P gear 0, back 1, neutral 2, forward 3 SEC 3 = 2: back 3, neutral 2, forward 1 SEC 3 = Other: neutral =0, forward =1, back =2.
2	Three gear speed state	3 bits: display the low speed / high speed status according to the control word ZN gear display, SEC 1 = 1 high speed and low speed reverse display SEC 1 = 2:123 Back, BST, P gear display SEC 1 = 3: neutral 0, gear display =1, 2, 3
		SEC 1 = 4: neutral 0, back 5, gear display 2, 3, 4 (H62) SEC 1 = 5: neutral 0, back A, gear 1, 2, 3 SEC 1 = 6: neutral 0x20, back 0x80, forward 0, 1, 2 SEC 1 = 7: neutral 0, backward 3, medium speed 0, low speed 1, high speed 2 SEC 1 = Other: gear display =0, 1, 2
3	Brake state	One

4	Cruise state	One
5	The bucket state	One
6	Side support state	One
7	Speed limit state	One
8	Repair the state	One
9	Back-state / motor direction	1 bit, the driverless project shows the motor direction
10	Power state / rotation direction	1 bit, the driverless project shows the direction of rotation
11	Implement the status / main relay	1 bit, the driverless project shows the status of the main relay
12	Parking P gear status	One
13	charged state	One
14	READY state	1, block without alarm can turn normally when bright, out after rotation.(CAN 58 Special: remains bright after rotation)
15	ECO state	One
16	ABS state	One
17	BOOST state	One

12.3.6 CAN alarm

14 alarms, the user can report or not:

project	content	The default value
1	Motor Hall fault	One
2	Turn the fault	One
3	Brake state	One
4	MOS hitch	One
5	Phase line short circuit failure	One
6	Phase line missing fault	One
7	The controller has an over-temperature alarm	One
8	The motor overtemperature alarm	One
9	Overflow alarm	One
10	Overpressure alarm	One
11	Warrant alarm	One
12	Shut to police	One
13	Anti-theft alarm	One
14	Controller alarm	One

13 Controller model description

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

- ND — Controller CustomerCode(AA-ZZ)
- 72 — Controller Rated voltage(V)
- 530 — Controller maximum phase current (A)
- B — Controller type (B indicates encoder version,otherwise Hall version)
- 1 — Controller Current Sensor type (1-9)
- 3 — Controller application type (0-9)
- A — Controller function code (0-9, A -Z)
- R — Controller Extension Code (*, 0-9, A-Z)
- H — Controller Hardware Version (0-9, A-Z)
- 68 — Controller Software Version (00-99)

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

- YQ — Controller Customer Code(AA-ZZ)
- 72V — Controller rated voltage (V)
- 270A — Controller maximum bus current (A)
- B — Controller type (B indicates encoder version)
- 1 — Controller Current Sensor Type (1-9)
- 3 — Controller Application Type (0-9)
- A — Controller function code (0-9,A-Z)
- R — Controller Extension Code (*, 0-9, A-Z)
- H — Controller Hardware Version (0-9, A-Z)
- 68 — Controller Software Version (00-99)