



MQCON E-Bike LCD Meter User Manual

V1.0

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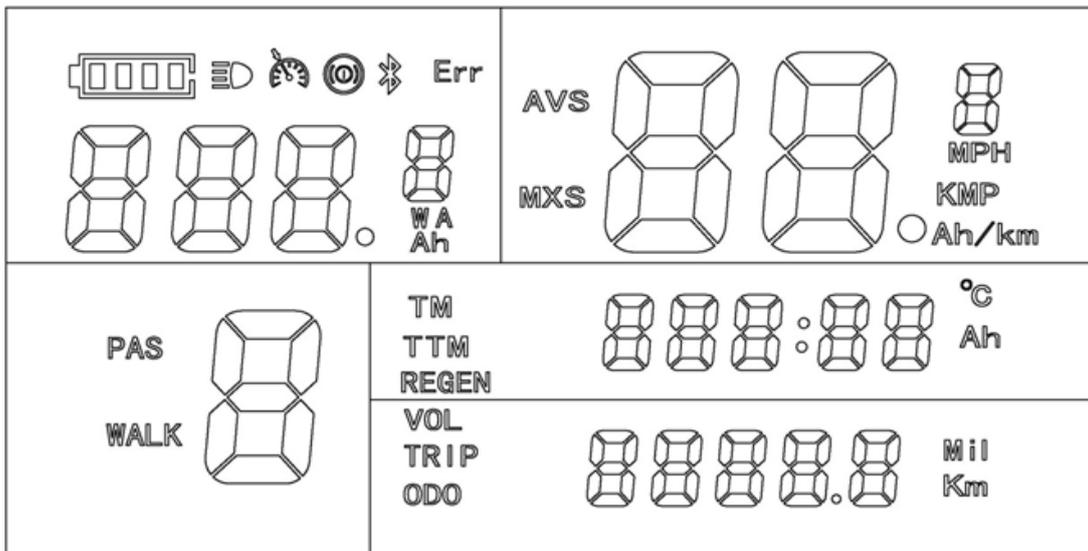
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PREFACE

This manual describes the use of the MQCON E-bike LCD meter, including function description, fault description, parameter setting, etc., the meter should match the MQCON SM-series FOC controller to better play the performance of the whole E- Bike.

Meter display content

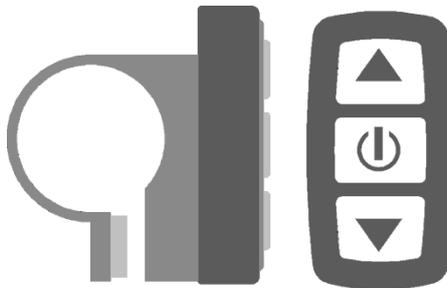


- ◇ Trip time display (a single trip time (TM) and total trip time (TTM))
- ◇ Trip speed display (displays of real-time speed (Km/H or MPH) and a single maximum speed (MXS) and a single average speed (AVS));
- ◇ Trip distance display (displays of a single trip distance (Trip) and total trip distance (ODO));
- ◇ PAS or handlebar gear (PAS) switch;
- ◇ Assistant push(WALK) function;

- ◇ Cruise function ();
- ◇ Battery capacity indicator ()display;
- ◇ Real-time battery voltage (**VOL**)display;
- ◇ Total consumption of electricity in a single operation(**Ah**) display;
- ◇ Electricity consumption per kilometer (**Ah/Km**)display;
- ◇ Total charge (**REGEN**) display;
- ◇ Motor running power(W) or current(A) display;
- ◇ Brake display ();
- ◇ Backlighting and lights ();
- ◇ Motor temperature display;
- ◇ Time and mileage data clearing
- ◇ Fault code display;

Button description

The button and the meter body are designed separately .There are three keys on the operating panel of button box, ▲ which are icons of button (UP), ⏻ button (alt text SW) and ▼ (alt text DOWN).



Button Box and Operating Panel

Normal Operation

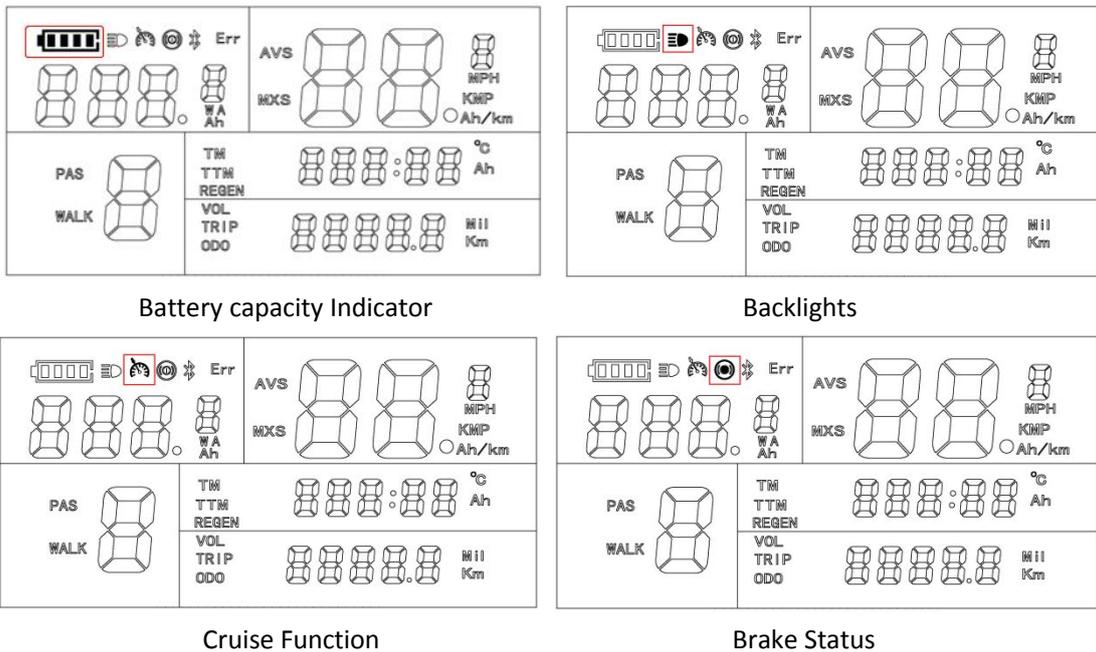
➤ On/Off

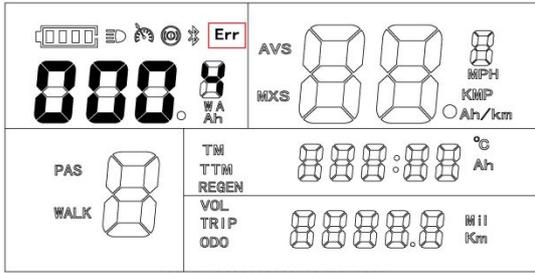
Hold button  (SW) long, the meter is powered on and it provides the controller with power supply. Under normal operating status, hold button  (SW) long, the meter is powered off, meanwhile to shutdown the power supply of controllers.

➤ Display Interface

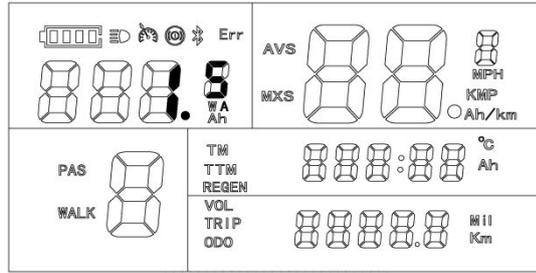
Display 1:

After meter power on,it will enter display 1。

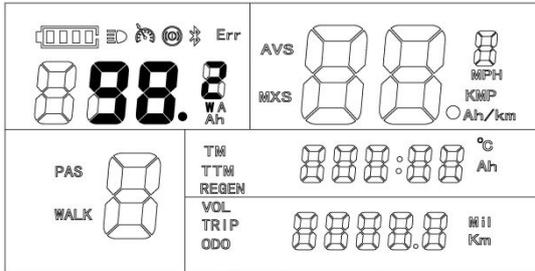




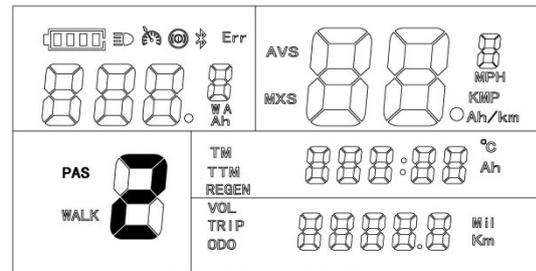
Fault code



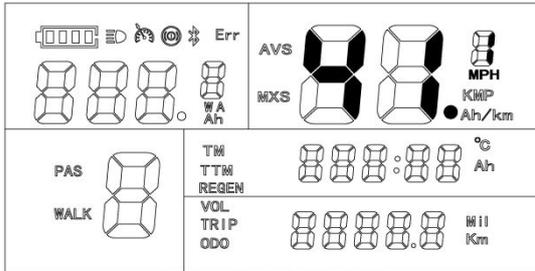
Real-time dc bus current



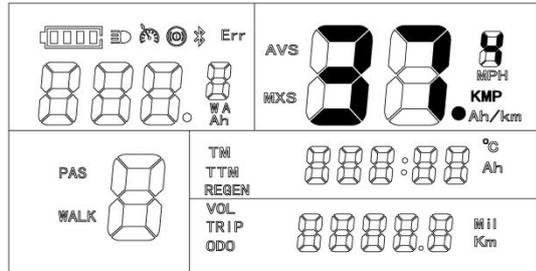
Real-time power output



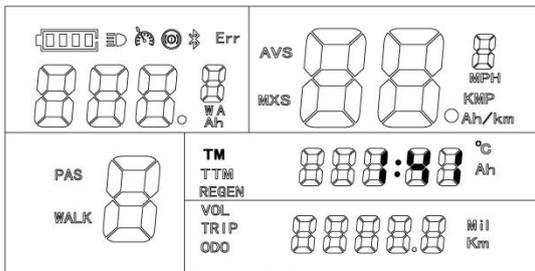
PAS gear



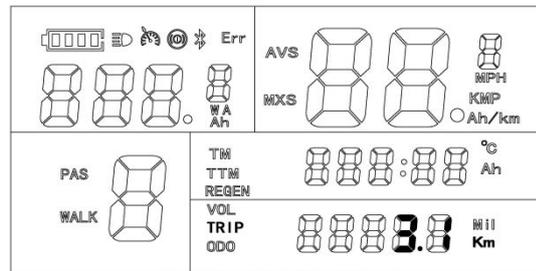
Real speed (MPH)



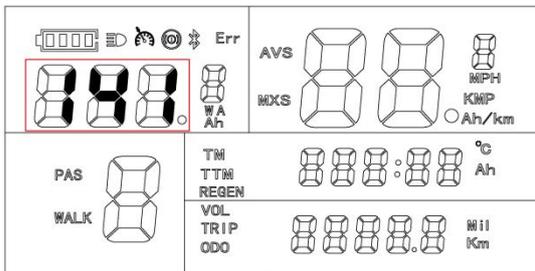
Real speed (KMP)



Single trip run time



Single trip distance

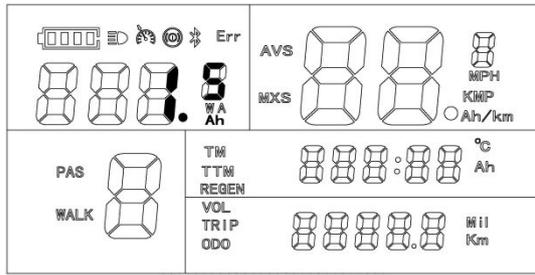


Power-on password setting

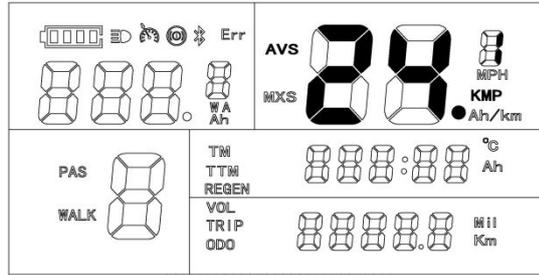
Display 2:

In display 1, hold button  (SW) shortly to enter display 2. after 5

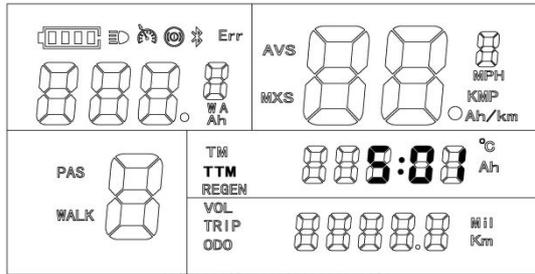
seconds, display 2 automatically returns to display 1.



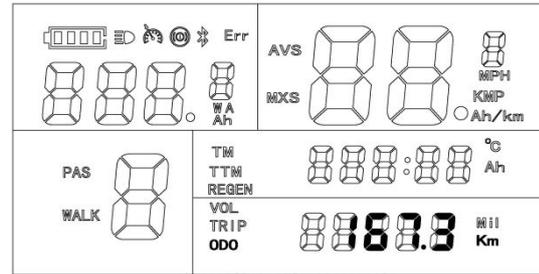
The power consumption (Ah) display



Average speed(AVS)



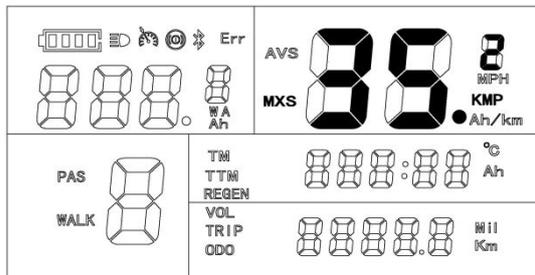
Total trip time



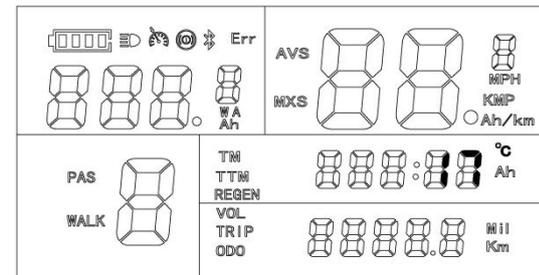
Total trip distance(ODO)

Display 3:

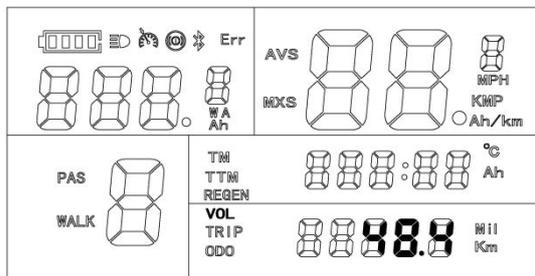
In display 2, hold button  (SW) shortly to enter display 3. after 5 seconds, display 3 automatically returns to display 1.



Max speed(MXS)



Motor temperature

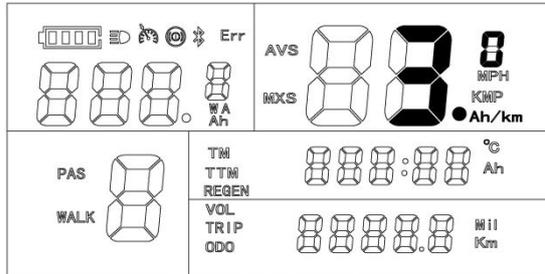


Real-time battery voltage

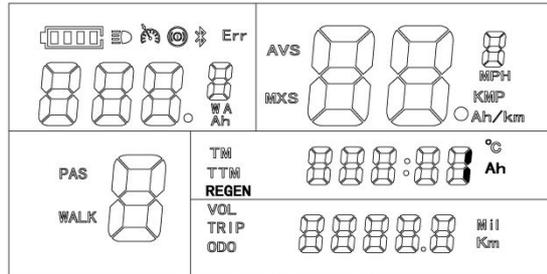
Display 4:

In display 3, hold button  (SW) shortly to enter display 4. after 5

seconds, display 4 automatically returns to display 1. In the display interface 4, short press the button  (SW), the meter will enter the display 1 again.



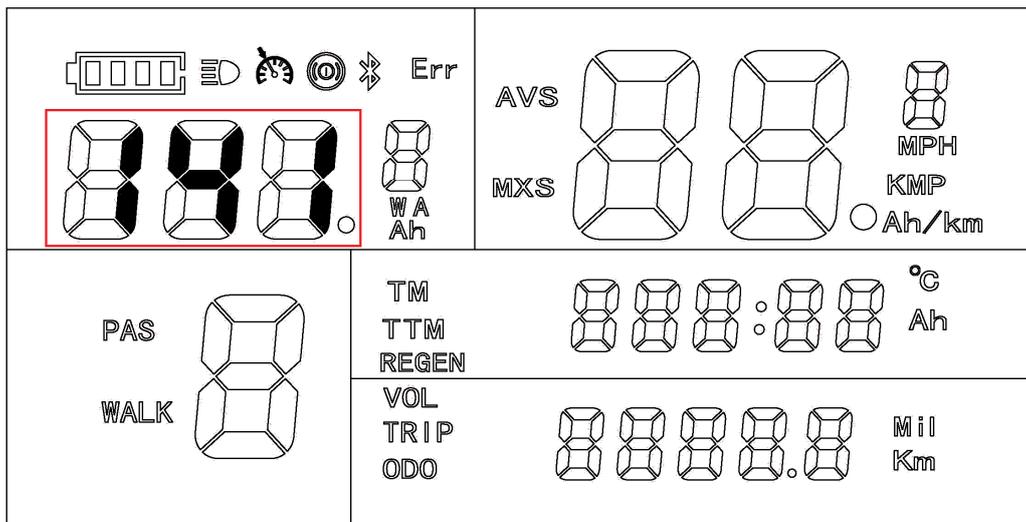
Electricity consumption per kilometer (Ah/km)



Total amount of running charge(Ah)

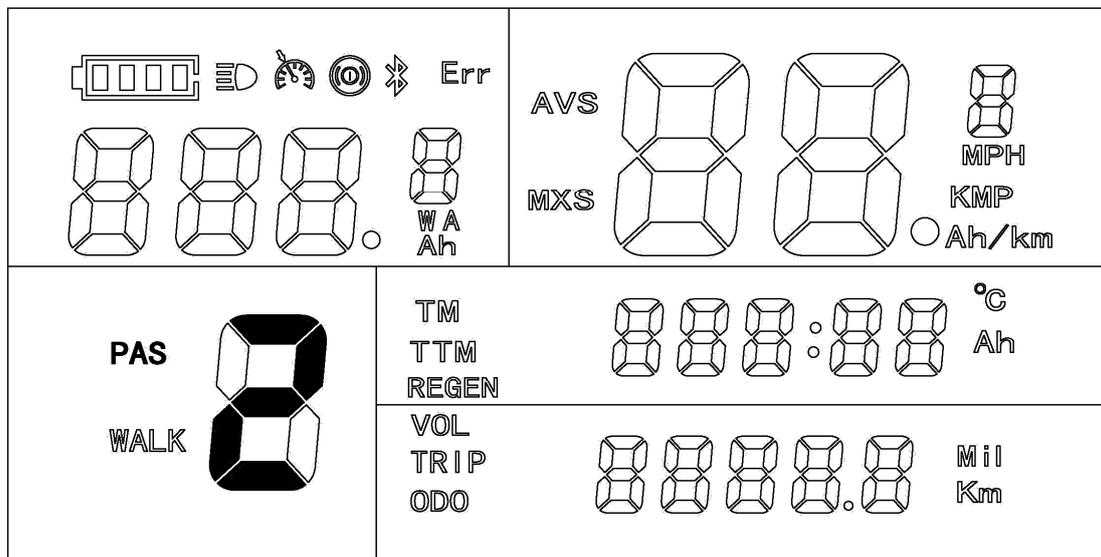
➤ Power-on password setting

The power-on password is entered in the position shown in the red box below. Short press the key  (sw) key to select the position to be entered. The selected position will flash to indicate that the bit is being set. Use the up and down keys to adjust the password value to be entered. When entering the correct password. After pressing short the key  (sw), the red box position will no longer display the entered password value, it will display the current or power value, indicating that the boot is successful.



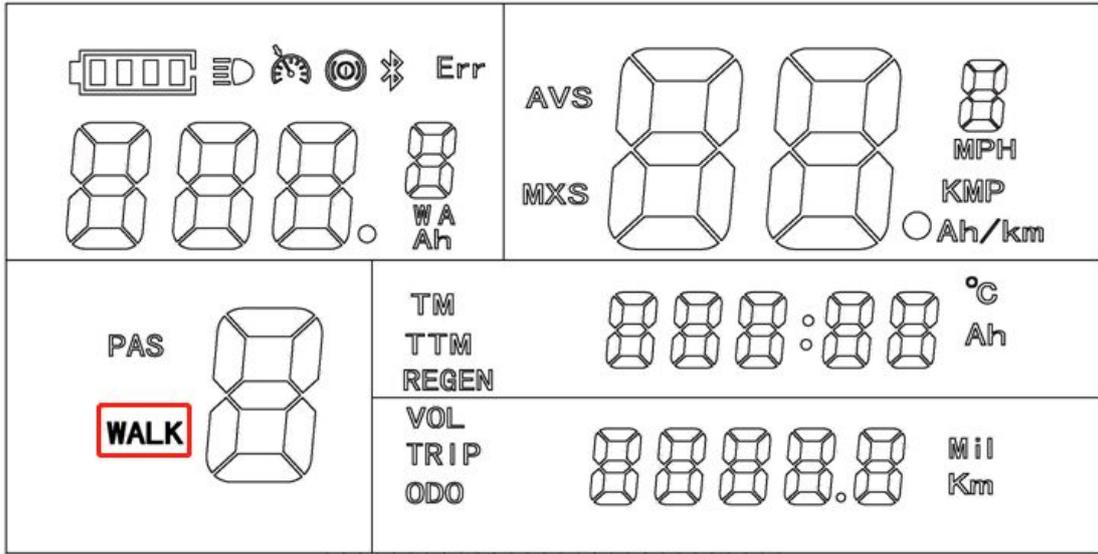
➤ PAS (or handbar) gear shift

When the meter is in normal operation, short press the key  (UP) or key  (DOWN) to switch the PAS (or handbar) gear position and change the motor output power. The switching range is 1-5, the 1st gear is the lowest power gear, and the fifth gear is the highest power gear. The starting position of each power-on is 1st gear.



➤ WALK function

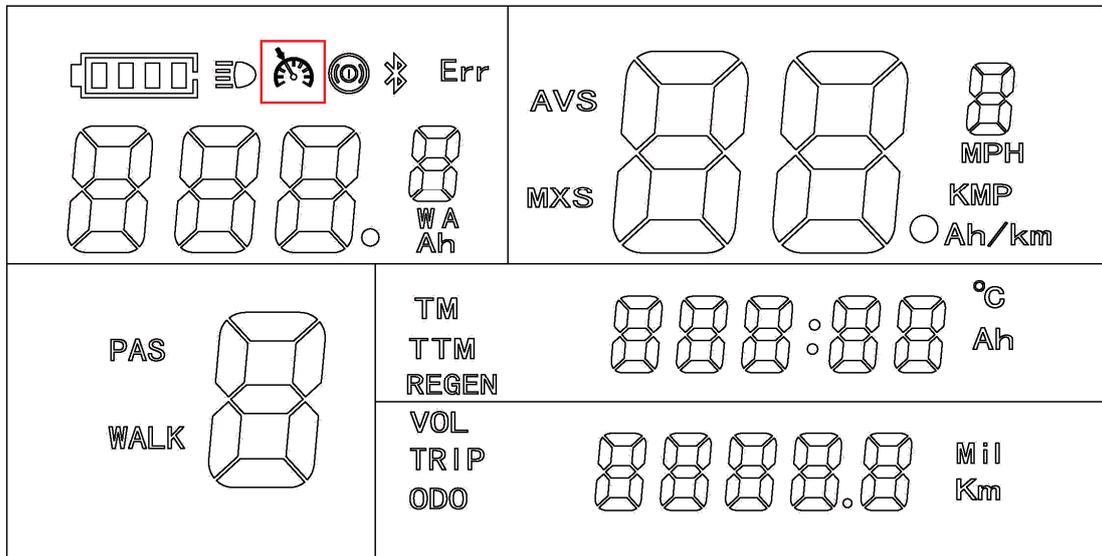
Users can use the WALK function when push the e-bike. While the e-bike is stationary, press and hold the button , the walk function flag (WALK) lights up and the e-bike travels at a lower speed. Release the button  (DOWN) and the walk function is cancelled.



➤ Cruise function

When the e-bike is running, press and hold the button  (DOWN) to enter the cruise state, and the cruise function indicator lights up.

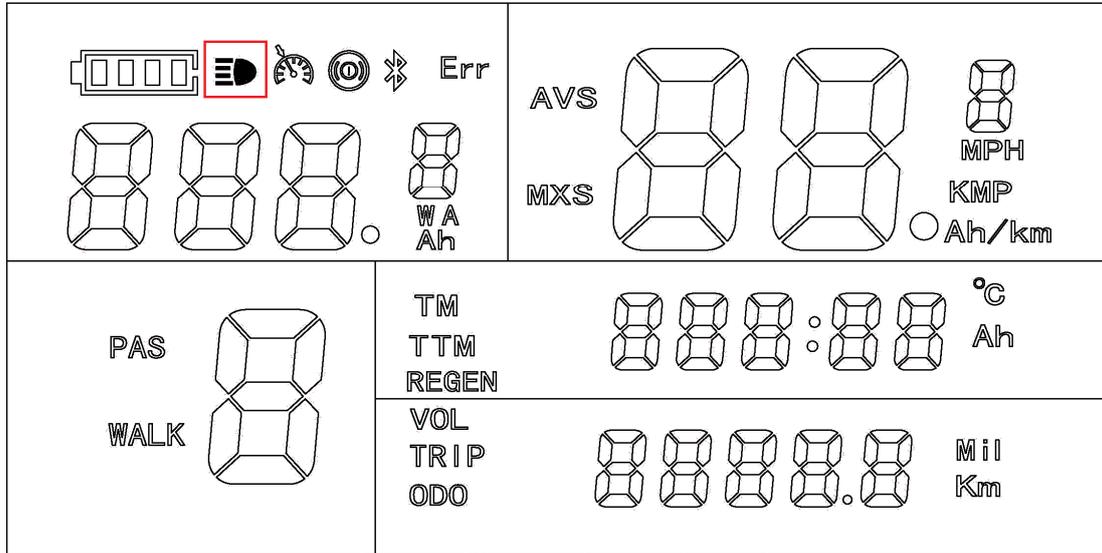
Brake or restart the handle to cancel the cruise function.



➤ Turn on the meter backlight and headlights

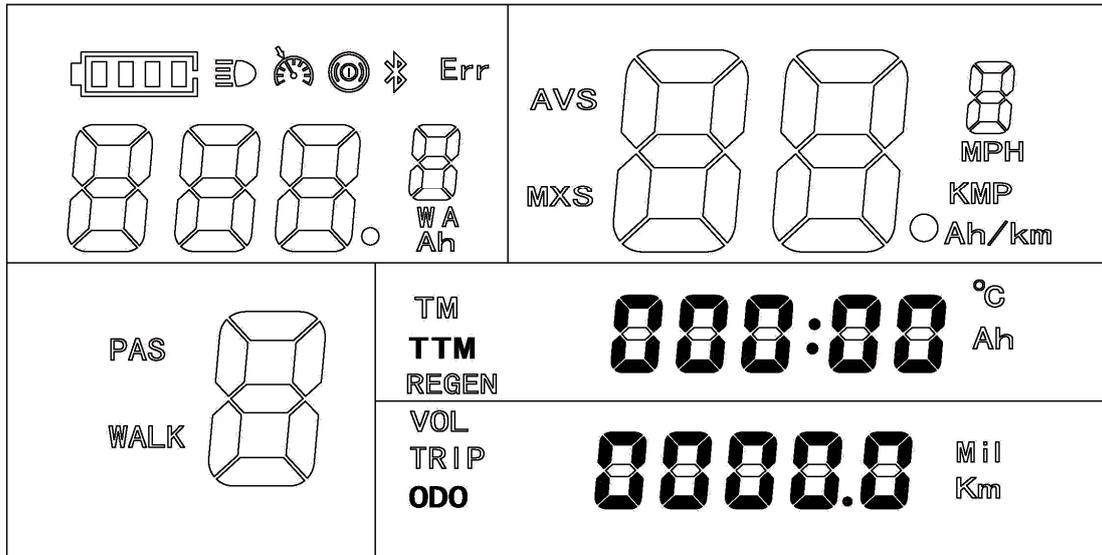
Press and hold the button  (UP), the meter turns on the backlight,

and the meter backlight and the lamp on flag (☰) light up. Press and hold the button again (▲)(UP) and the backlight turns off.



➤ Data clearing

After the meter is turned on for 60 seconds, on the display interface 1, press the button (▲) (UP) and the button (▼) (DOWN) for about 3 seconds. The total riding time (TTM) and the total riding distance (ODO) flash. The button (SW) (⏻), the recorded content of both is cleared.



Single data clear display

When the data is flashing, if the recorded content is not cleared within 5 seconds, the meter will automatically return to the display interface 1 and the original recorded content will be retained.

➤ Battery compartment display:



In the meter battery shape chart, the correspondence between the number of cells and the bus voltage under different systems is shown in the following table:

voltage display	24V	36V	48V
	Four grid	25V	38V

Three grid	24V	36V	48V
Two grid	undervoltage+2 V	undervoltage +4V	undervoltage +5V
One grid	undervoltage +1V	undervoltage +2V	undervoltage +2V
Battery frame	undervoltage +0.5V	undervoltage +0.5V	undervoltage +0.5V
Frame flashing	< undervoltage +0.5V	< undervoltage +0.5V	< undervoltage +0.5V

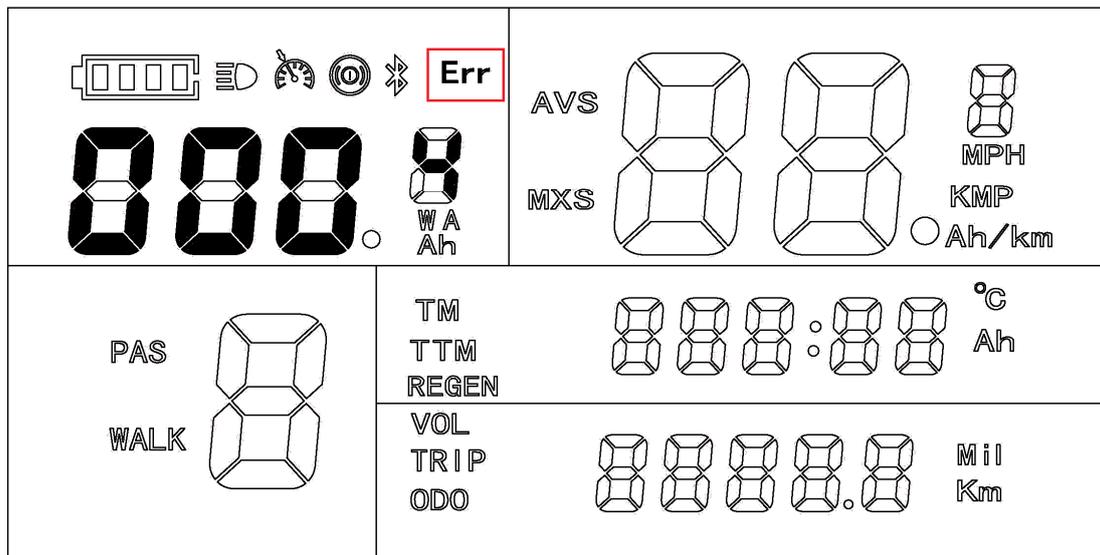
➤ Auto prompt interface

Fault code display:

When the e-bike control system fails or not in normal status, the meter will display (flashing) the fault code. The fault is eliminated and the fault code display interface is automatically exited.

Fault code	Fault description
0001	Power-on anti-speed vehicle
0002	Handbar fault
0004	Motor hall fault
0008	Motor stall
0010	Over current protect

0020	Over voltage protect
0040	Lack voltage protect
0080	Hardware protect
0100	Brake status
0200	Upper drive arm failure
0400	lower drive arm failure
0800	Motor over temperature protection
1000	Communicate error between meter and controller

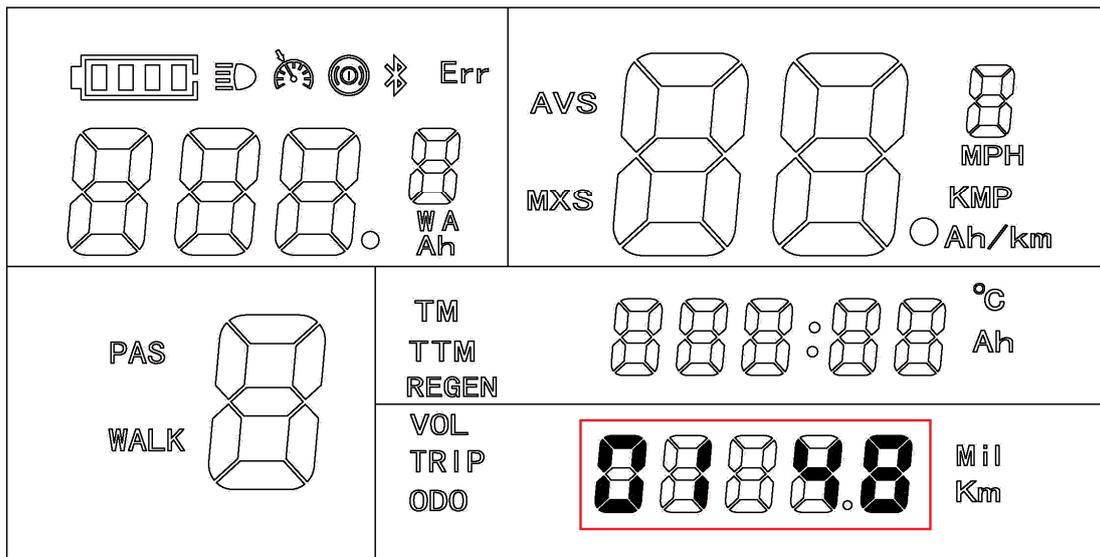


Parameter settings

➤ Setting operation

In the off state, press and hold the button  (SW) to turn the meter on. Within 60 seconds after power on, press the key  (UP) and the key  (DOWN) for about 3 seconds to enter the parameter

setting interface. The parameter and parameter number to be set are displayed at the cumulative kilometer. The set parameter is flashing. The short button ▲(UP) or button ▼(DOWN) can set the parameter value. After the setting is completed, the short button ⏻(SW) can be used to enter the next step. Item setting, you can also press the long button ⏻(SW) for about 3 seconds to save the parameters that have been set, or press the button ▲(UP) and the button ▼(DOWN) for about 3 seconds to exit the parameter setting interface. The parameters set at this time will not be saved, return to display interface。



As shown in the above figure, the 01 parameter is the rated voltage value, indicating that the controller is a 48V controller, and the word “48” is flashing. Set the controller's rated voltage value with a short button ▲(UP) or key ▼(DOWN), short button ⏻(SW) can enter the 02 parameter setting, or press the long button ⏻(SW) for about 3 seconds, save the set rated voltage value and exit the parameter

setting, or press the button  (UP) and the button  (DOWN) for about 3 seconds to exit the parameter. the rated voltage value set at this time will not be saved.

➤ Parameter description

P1	Rate voltage
P2	Speed limit
P3	Handbar gear enable
P4	PAS sensitivity
P5	PAS type
P6	PAS output initial value
P7	PAS strength
P8	External hall set
P9	Bus current limit setting
P10	Under-voltage setting
P11	Cruise enable
P12	ABS intensity
P13	Wheel diameter
P14	Motor pole pair* differential ratio
P15	Motor temperature limit value
P16	Motor temperature protection value
P17	Restore to factory settings

P18	Metric - Imperial setting
P19	Power-on password
P20	Current /power display selection
P21	Data source setting
P22	Drive mode
P23	Zero start selection

◆ P1、rate voltage

This value is used to set the system voltage, mainly affecting the display of the battery voltage, and the under-voltage point. The under-voltage value is determined according to the rated voltage and the P10 parameter (under-voltage setting). For details, refer to the P10 parameter.

◆ P2、speed limit

Set the maximum speed of the e-bike. For example, if the value is set to 25, when the screen is displayed in metric (determined by P18 parameters), the maximum speed is 25km/h. When the screen is displayed in imperial, the maximum speed is 25mil/h.

◆ P3、handbar gear enable

When enabled, the gear position can adjust the maximum handbar output power for 5 gear positions. When disabled, the maximum

handbar output power of the controller is always the maximum value.

◆ P4、PAS sensitivity

When the pas signal is detected, it is judged whether the pas mode is turned on according to the sensitivity value. For example, when the value is set to 10, it indicates that the controller detects the 10 cycle pas signal and then turns on the pas mode, so the smaller the value is set, The higher the sensitivity the value, the short button  (UP) or the button  (DOWN) selects the value of this value, ranging from 0 to 20.

◆ P5、PAS type

0: When the pedal is forwarded, the sensor output signal is high for a time greater than the low time. When the pedal is pedaled backward, the sensor output signal is high level time less than the low level time。

1: When the pedal is forwarded, the sensor output signal is low for more than the high time. When the pedal is pedaled backward, the sensor output signal is low for less than the high time.

2: When the pedal is forwarded, the sensor output signal high time is equal to the low time , When the pedal is stepped backward, the sensor output signal has no high or low level change.

◆ P6、PAS output initial value

The initial speed value of the e-bike start is divided into 4 levels to adjust the initial speed at startup.

◆ P7、PAS strength

When the handbar is zero, the pas function is effective, the faster the pedal rotates, the larger the pas output, and the output strength can be adjusted according to this value, which is divided into 50 levels. The larger the value, the greater the strength.

◆ P8、External speed hall set

Some motors are equipped with an external hall to calculate the speed. If this value is set to 0, it means there is no external hall. If any value other than 0 is set, it means there is an external hall (the maximum is 5). if this value is set to 1, which means that the motor turns to a mechanical cycle while the external hall generates a periodic square wave; if set to 2, it means that the motor turns to a mechanical cycle while the external hall generates two periodic square waves, and so on.

◆ P9、Bus current limit setting

P9 value	The maximum current value (A) is equal to
04	40% of the maximum current value
05	50% of the maximum current value

06	60% of the maximum current value
07	70% of the maximum current value
08	80% of the maximum current value
09	90% of the maximum current value
10	maximum current value

◆ P10、Under-voltage setting

For the controller minimum operating voltage adjustment (under-voltage value fine-tuning) setting, the default value is 4, the setting range is 0-7, short press  (UP) or key  (DOWN) to select.

Voltage set	Under-voltage				
	24V	36V	48V	60V	72V
0	-4V	-4V	-4V	-4V	-4V
1	-3V	-3V	-3V	-3V	-3V
2	-2V	-2V	-2V	-2V	-2V
3	-1V	-1V	-1V	-1V	-1V
4	default 20V	default 30V	default 40V	default 52V	default 62V
5	+1V	+1V	+1V	+1V	+1V
6	+2V	+2V	+2V	+2V	+2V
7	+3V	+3V	+3V	+3V	+3V

The default value is 4, when set to 5, the default value is added to 1V, when set to 3, the default value is reduced by 1V, and so on.

◆ P11、Cruise function enable

Set 1 means to enable cruise function, set 0 means disable cruise function.

◆ P12、ABS intensity

It is divided into 6 levels of intensity, the set value range is 0-5. When set to 0, it means no ABS function. The larger the value, the greater the brake strength.

◆ P13、Wheel diameter

The wheel diameter is in inches and the wheel diameters that can be set are 6, 8, 10, 12...30 (inches).

◆ P14、Motor pole pair* differential ratio

The value set is the motor pole pair* differential ratio. In the case of no differential, only the motor pole pair is set.

For example, if the current motor is 23 poles and the differential ratio of the differential is 2, then this value should be set to 46.

◆ P15、 Motor temperature limit value

When the motor temperature is higher than this value, the bus current limit value is operated according to 50% of the P9 setting value.

◆ P16、 Motor temperature protection value

When the motor temperature is higher than this value, the controller stops output and reports the motor temperature over temperature fault.

◆ P17、 Restore to factory settings.

When this value is set to 1, and long press the button  (SW) for about 3 seconds to save, all parameters of the controller will be restored to factory settings.

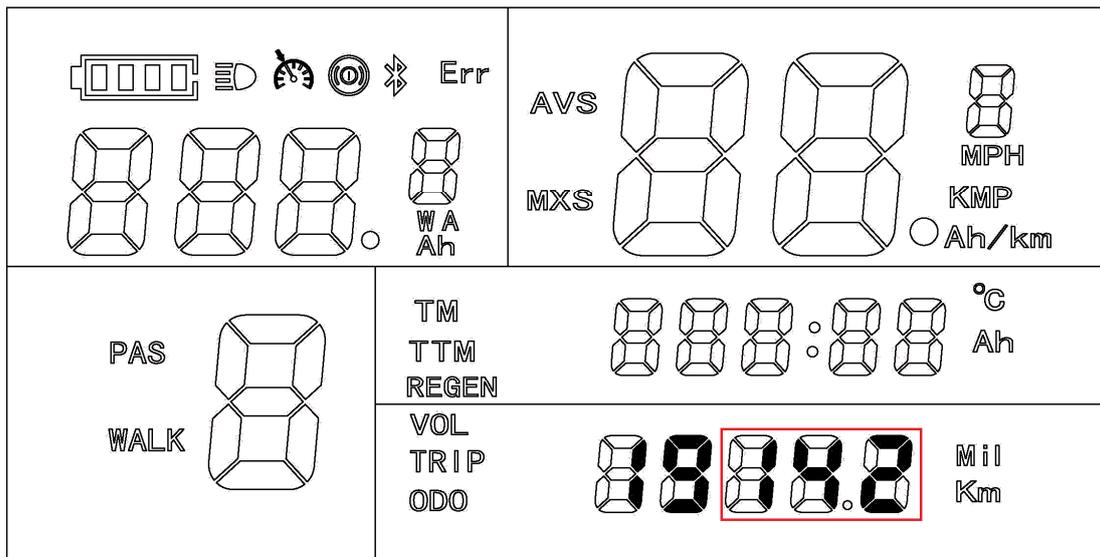
◆ P18、 Metric-Imperial setting

When this value is set to 0, it represents the metric setting, the speed unit is km/h, and the mileage unit is km. When this value is set to 1, it represents the imperial system setting, the speed unit is MPH, and the mileage unit is mil.

◆ P19、 Power-on password

Set the password in the red box position as shown in the figure

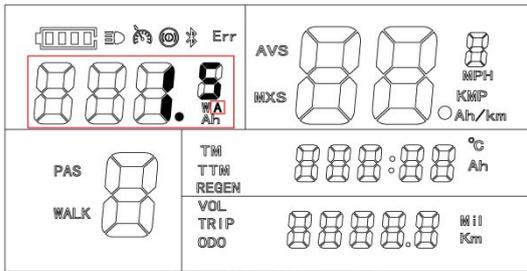
below. the 19th parameter is to set the power-on password. Short press the botton  (sw) to select the number of digits to be set, use the up and down keys to adjust the value of the number. After setting the password, long press  (sw) to save the currently set password value. If the password is set to 0, there is no password, and the e-bike can be started without entering a password when power on. If there is a password, the parameter modification function and the switching interface operation cannot be performed before the correct password is entered.



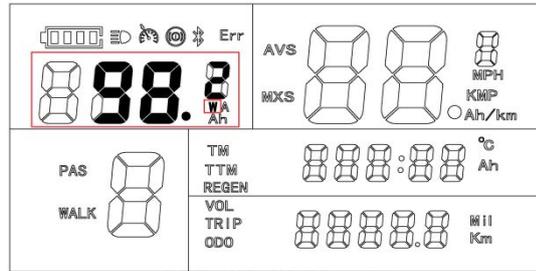
Note: Be sure to remember after changing the password, otherwise the table will be locked Permanently.

◆ P20、Current /power display selection

When this value is set to 0, the meter displays the bus current; when this value is set to 1, the meter displays output power.



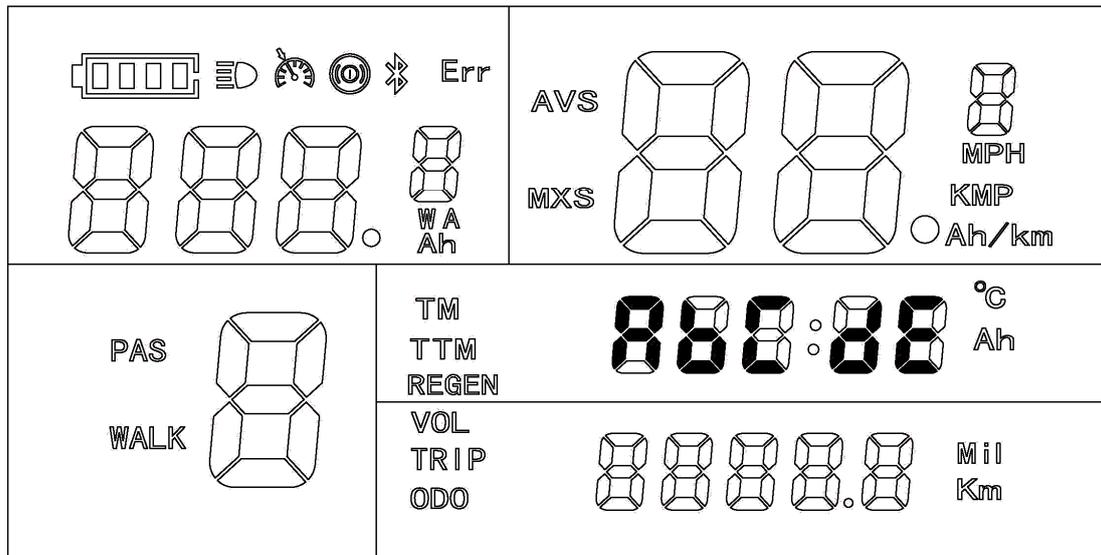
the real-time bus current



the real-time output power.

◆ P21、Data source setting

When this value is set to 1, this meter is no longer used for data display, but for data copying. and at this time, in the time display column, the letter "AbCdE" is displayed to indicate that the current screen is in the data copy function, as shown in the following figure.。



Data copy function introduction and operation instructions: This function mainly realizes data copy between different parameter controllers. If there are two controllers A and B controllers at present, the user wants to completely copy the parameters of the A controller to the B controller, which can be realized by this function.

First set the P21 parameter to 0, and then power up with the A controller to ensure proper wiring, and ensure that the A controller can communicate normally (that is, the meter can display the status information of the A controller, such as the speed fault). At this time, set this parameter to 1, and after the long button  (SW) to save for about 3 seconds, the meter will be in the state of the display 1 interface. In the time display column, the letter “AbCdE” will be displayed, Press and hold the button  (SW) again for about 3 seconds to turn off the meter and controller.

In the second step, the meter is disconnected from the A controller and connected to the B controller. After power-on, press the button  (UP) and the button  (DOWN) for about 3 seconds to enter the parameter setting interface. At this time, no parameters need to be modified. Press the button  (SW) for about 3 seconds to save. At this time, the parameters of the B controller are exactly the same as A.

If you want to continue to copy the parameters to C, D, E... and other controllers, you don't need to connect the meter to the A controller again. You only need to repeat the second step again, Connect the meter to the controllers such as C, D, E, etc., and save the parameters.

◆ P22、 Drive mode

0—only PAS mode

1 - only the handbar mode

2—The pas mode switch mode coexists, and the handbar mode takes precedence. When the handbar is effective, the controller output follows the handbar command.

◆ P23、 Zero start selection

0—zero start mode

1—non-zero start mode