
Product Specification

04/2018

Product	TFT LCD Display
----------------	-----------------

Mode	
-------------	--

Abbreviation	C14-BF
---------------------	--------

Client	
---------------	--

Customer	
-----------------	--

audit	
--------------	--

Supplier	Tianjin APT Science and Technology Co., Ltd.
-----------------	--

	1001, Building 5 HuaDing, No.1 HuaKe 3 Road, Binhai hi-tech Industrial Development Zone, Tianjin, China
--	---

Tel	TEL:+86 22 83715556 FAX:+86 22 83719955
------------	--

Email	<u>yzhao@aptdevelop.com</u>
--------------	---

1. Product Name

- ✧ TFT LCD display
- ✧ Model : C14

2. Suppliers

- ✧ Tianjin APT Science and Technology co., Ltd

3. Electrical Parameters

- ✧ 3.2inch IPS screen
- ✧ 24V/36V/48V battery supply
- ✧ Rated operating current : 40mA
- ✧ Max operating current : 100mA (36V battery, with USB equipment changed)
- ✧ USB changing port : 5V 500mA
- ✧ Off leakage current < 1uA
- ✧ Max output current to controller : 100mA
- ✧ Operating temperature : -20~70℃, Storage temperature : -30~80℃

4. Dimensions & Material

- ✧ Product shell is ABS, transparent window is made with high strength Acrylic.
- ✧ Dimensions : host/L92mm*W60mm*H14mm



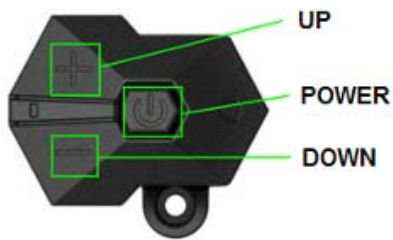
5. Features

- ✧ Suitable for low temperature, Max -20℃.
- ✧ High-contrast 3.2inch IPS colorful matrix screen.
- ✧ Ergonomic external button design, easy to operate.
- ✧ **Speed display** : AVG SPEED, MAX SPEED, SPEED(Real-time).
- ✧ **Kilometer / Mile** : Can be set according to customers' habits.
- ✧ **Smart battery indicator** : Provide a reliable battery indicator.
- ✧ **9-level Assist** : 3-level/5-level/9-level optional.
- ✧ **Mileage indicator** : Odometer/Trip distance/ Clock/ Riding time.
- ✧ **Power/Current indicator** : real time power indicator, digital or analog or Current.
- ✧ **Error code indicator.**
- ✧ Light sensor (Optional)
- ✧ **Software upgraded** : Software can be upgraded through UART.
- ✧ **USB charging port** : 5V/500mA

6. TFT screen instructions



7. Functional Description



7.1 Power On/Off

Press and hold **Power** button for 1 second can turn on/off the display. The Display can automatically shut down when there is no operate & ride for X minutes (X could be 0~9) .

*If the display has been set password power on, you need to input the right password before start.

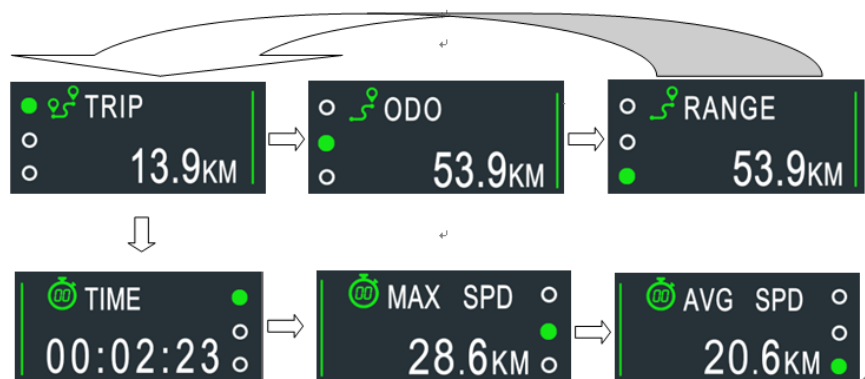
7.2 Assist level operating

Short press **UP/DOWN** button can change the assist level. Top assist level is 9, 0 for neutral. Level quantities can be adjusted according to the customer requirements.



7.3 Speed & Mileage mode switch

Short press **POWER** button can change the speed and mileage mode, TRIP→ODO→RANGE→TRIP→TIME→MAX SPEED→AVG SPEED



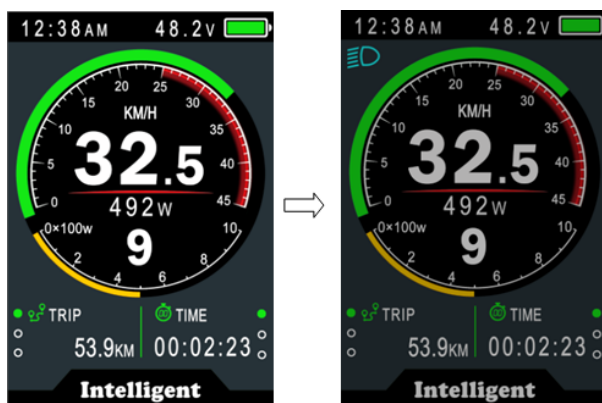
*Range need smart BMS support.

**If there is no operation for 5 seconds, display will return Speed (Real-Time) display automatically.

7.4 Headlight/backlight On/Off

Press and hold **UP** button for 1 second can turn on/off the headlight, and the screen will switch to the corresponding mode.

*The motor does not work when the battery voltage is low, Display still can keep the headlight on for a while when E-bike is in riding.

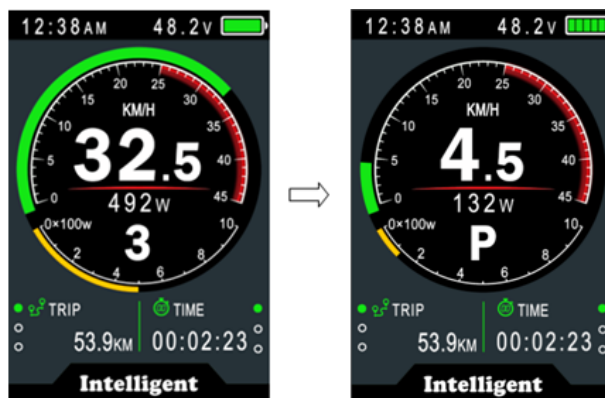


Daytime mode

night mode

7.5 Walking mode (6km)

Press and hold **DOWN** button for 2 second can get into walking mode, out of the mode when release the button.



* This feature needs to be supported by controller.

7.6 Data cleanup

Press and hold **UP** & **DOWN** buttons together for 1 second can reset several temporary data, temporary data include **AVG Speed / MAX Speed / Trip / Time**.

* These temporary data can't be erased by power off.

8. Parameter setting

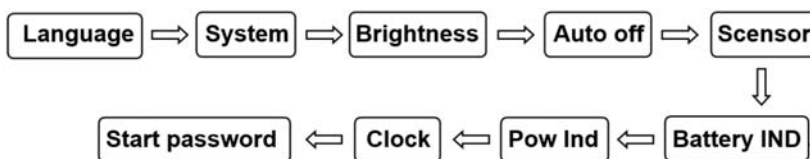
Double press **POWER** button (press interval less than 0.3 second) can get into setting menus, press **UP/DOWN** buttons to change the parameter setting, press **POWER** button can switch to next item. Double press **POWER** button will exit from menu.

* Display will automatically quit menu when there is no operation for 30 seconds.

* For safety reasons, display can't get into MENU when riding.

* Display will quit MENU when start riding.

The order of parameters are as follow.



8.1 Language: Default EN , Un adjustable

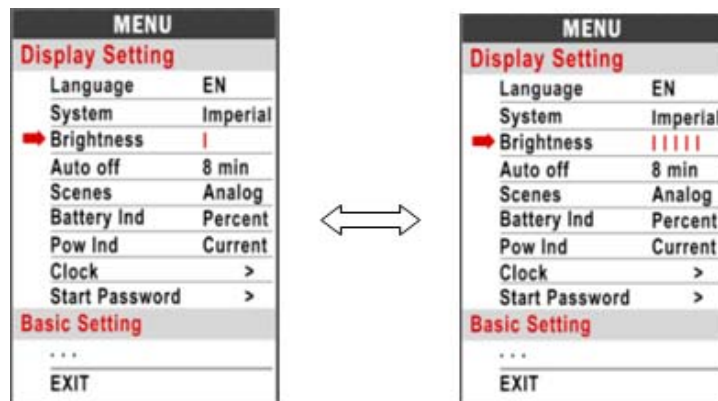
MENU	
Display Setting	
→ Language	EN
System	Metric
Brightness	
Auto off	8 min
Scenes	Analog
Battery Ind	Percent
Pow Ind	Current
Clock	>
Start Password	>
Basic Setting	
...	
EXIT	

8.2 System : Press Up / Down button to switch between Metric / Imperial.

MENU	
Display Setting	
Language	EN
→ System	Metric
Brightness	
Auto off	8 min
Scenes	Analog
Battery Ind	Percent
Pow Ind	Current
Clock	>
Start Password	>
Basic Setting	
...	
EXIT	

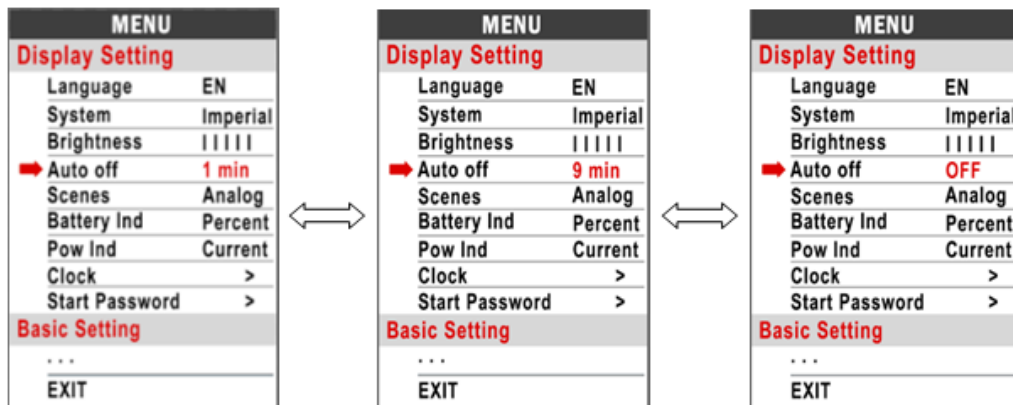
MENU	
Display Setting	
Language	EN
→ System	Imperial
Brightness	
Auto off	8 min
Scenes	Analog
Battery Ind	Percent
Pow Ind	Current
Clock	>
Start Password	>
Basic Setting	
...	
EXIT	

8.3 Brightness : Press Up / Down button to change the brightness of the backlight, **I** is darkness, **|||||** is brightness, default value is **I**.

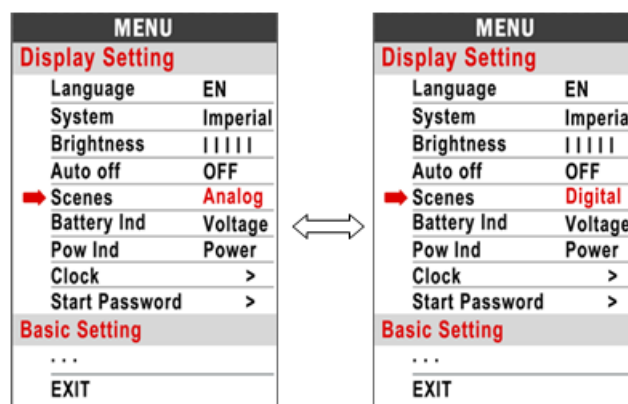


Note : You can set brightness independently between Daytime mode and Night mode.

8.4 Auto off : Press UP/DOWN button to change the auto power off time, from 1 to 9/OFF, the number represent minutes to shutdown, OFF means disable auto off function, default value is 5 minutes.



8.5 Scenes : Analog only



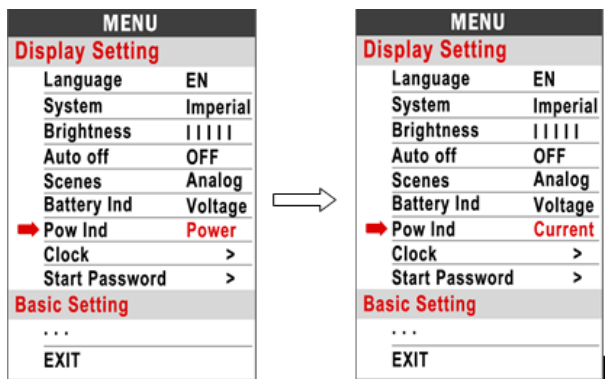
8.6 Battery Ind : Press UP/DOWN button to change the battery indicator, Voltage / Percentage / OFF.

*Accurate percentage needs communication with battery.



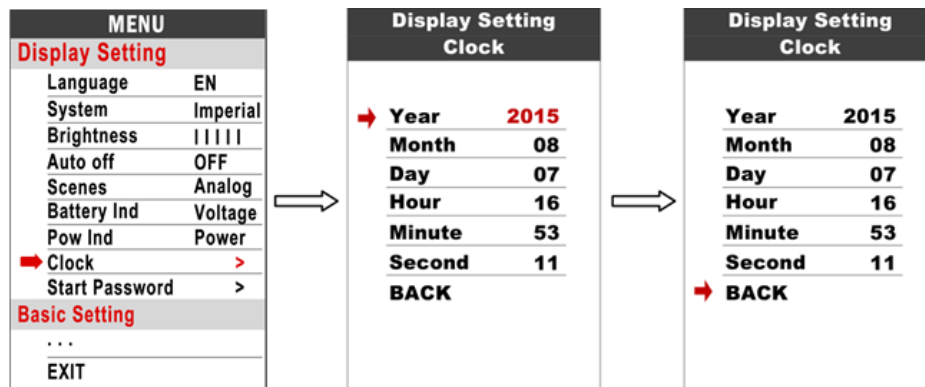
8.7 Pow Ind : Press UP/DOWN button to change the Power indicator, Power / Current.

* This data represent power output of the battery (not motor).





8.8 Clock : Clock setting, press POWER button get into the clock setting menu, press UP/DOWN button to set Year/Month/Day/Hour/Min/Sec.

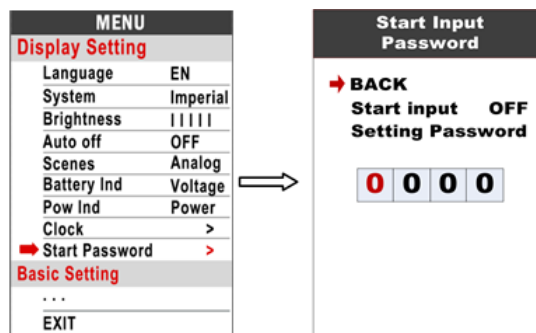


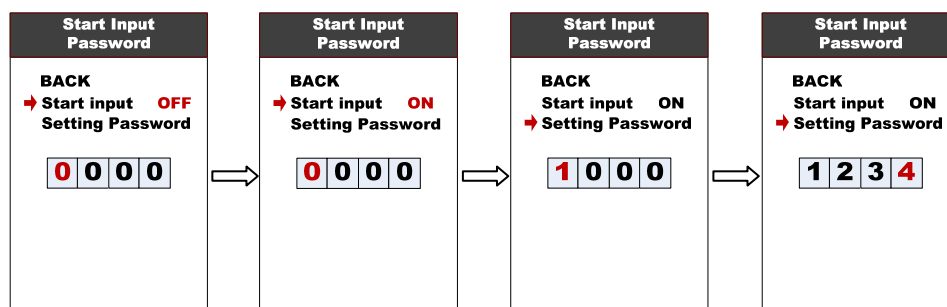
Note: There is a rechargeable battery inside display, it keeps the clock running when display is powered off. The battery can be charged by the external power when display is power on. This battery can maintain clock running for 100-120 days while it has not been charged. Battery may be exhausted after long time unused (after winter or transportation), you need to recharge the battery as below.

Set Menu : Auto off -> OFF (make display can't power off automatically)

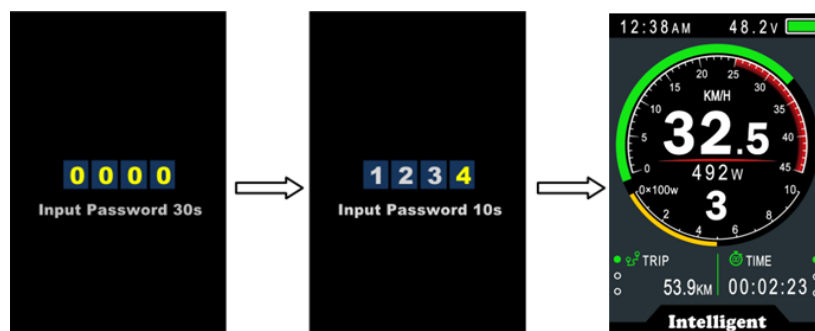
Keep the display power on for 72 hours, it can charge the battery.

8.9 Start password : Press POWER button get into the password setting menu. If you had set Start input ON, you must input right password before power on, password is accorded to your setting.

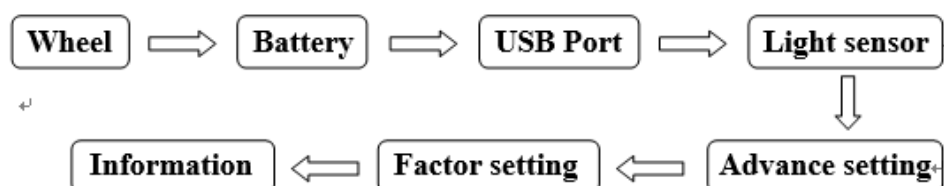




You need to input the right password before start with 30 seconds, display will power off automatically if the password was wrong.

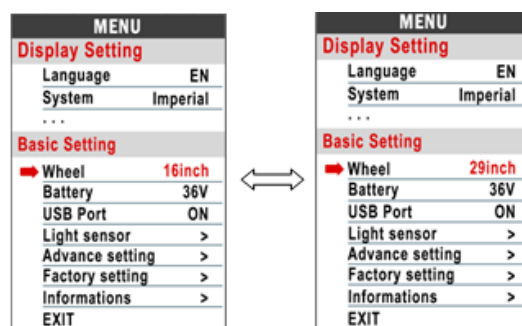


Basic Setting

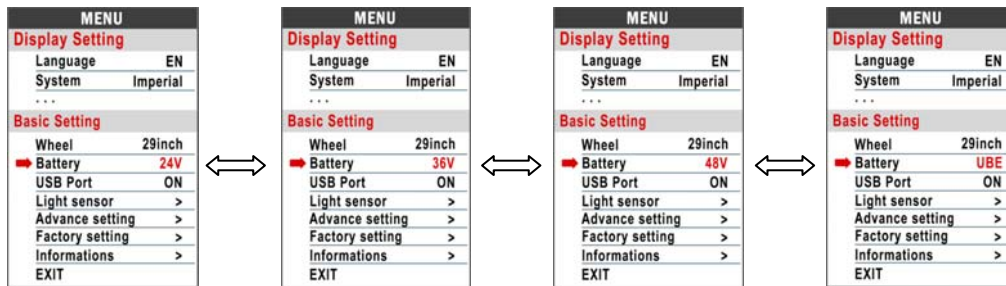


*Press DOWN button to move the red arrow to **Wheel**, press POWER button can show all items of the Basic Setting.

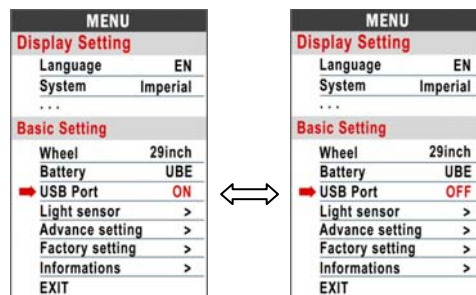
- 8.10 Wheel** : Press UP/DOWN can change the wheel setting, optional wheel diameter is 16/18/20/22/24/26/27/27.5/28/29/30/31 inch, 51cm~255cm represent wheel circumference (this needs controller support).



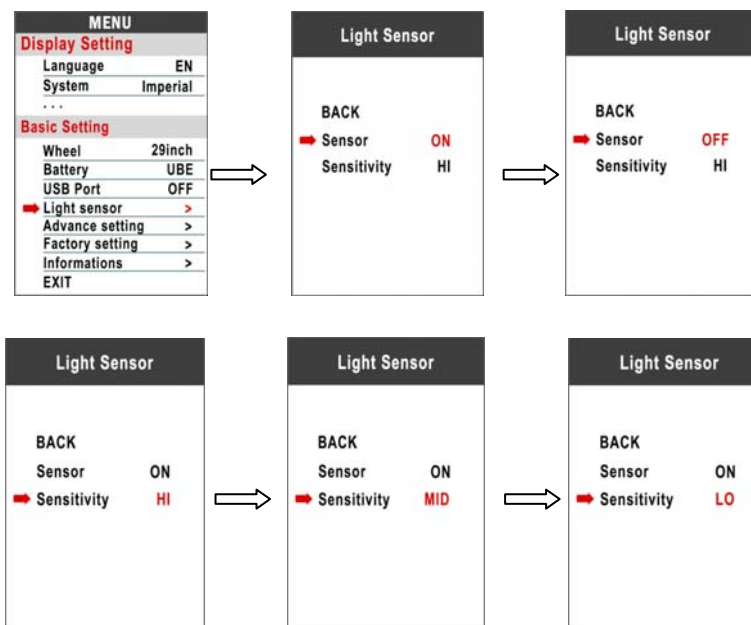
- 8.11 Battery** : This option is invalid for Bafang's system.



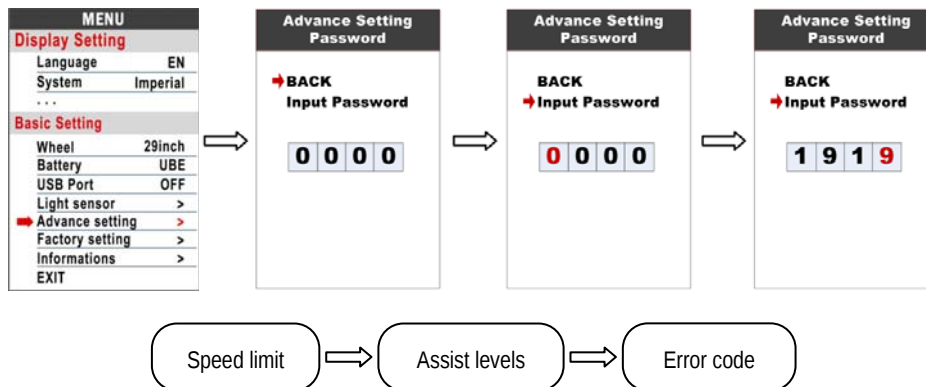
8.12 USB Port: press **UP/DOWN** level, select pres **OFF/ON**, Will be no Voltage/Current output after switching off.



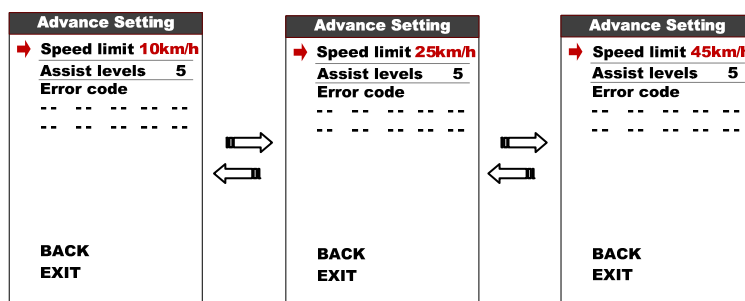
8.13 Light sensor: Light sensor item, press **switch Button**, enter into Light sensor interface, Press **UP/DOWN** button select **OFF/ON**; select Sensitivity, press **UP/Down** Select sensitivity of light sensation **HI/MID/LO**



8.14 Advance setting : Press POWER button can get into the advance setting menu, default password is '1919'.

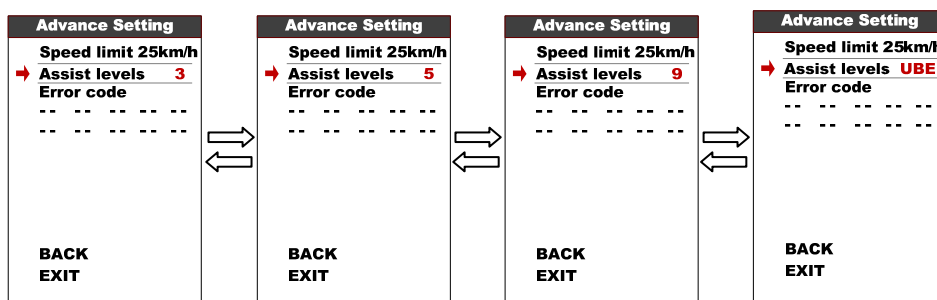


8.15 Speed limit : Press UP/DOWN will change speed limit, range 10km/h~45km/h.
Default value is 25km/h.



*Speed limit and current limit are restricted by controller and motor.

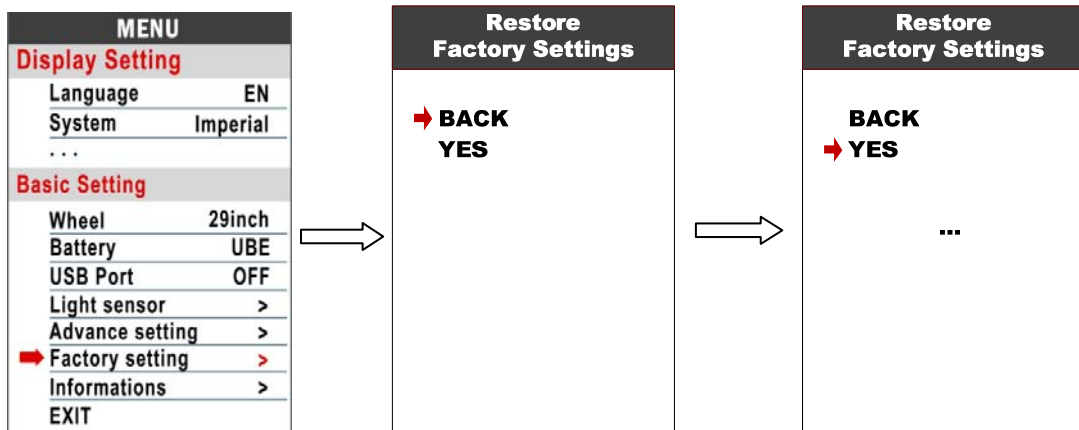
8.16 Assist levels : This parameter can customize assist levels, options are 3/5/9/UBE, UBE represent factory default settings.



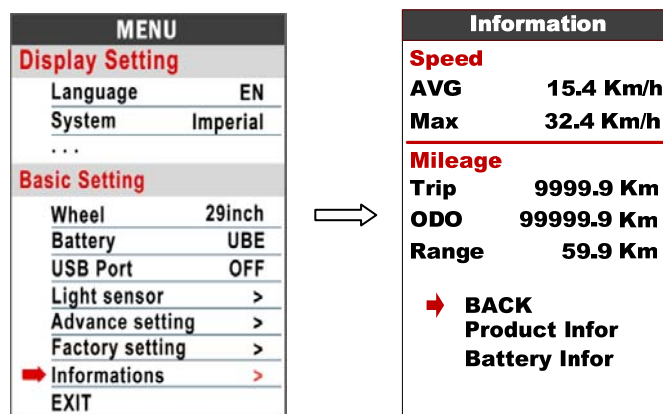
8.17 Error code : Display the last 10 times error code.

Advance Setting	
Speed limit	25km/h
Assist levels	5
Error code	
04	09 11 21 08
30	24 12 23 07
→ BACK	
EXIT	

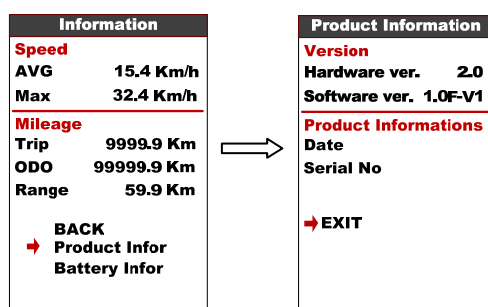
8.18 Factory setting : Press POWER button enter Restore Factory settings item, set YES will restore all parameter to factory settings.



8.19 Information : Show information of the E-bike.

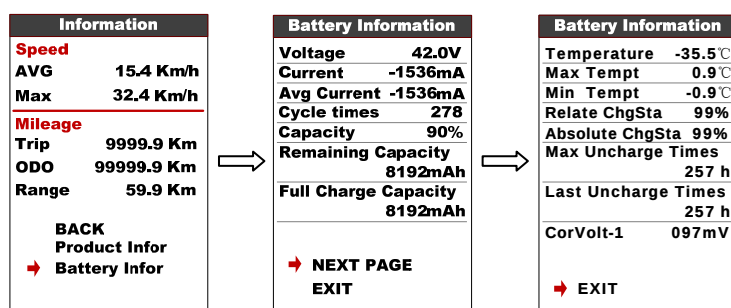


8.20 Product info : Get into this item can show hardware version software version...



8.21 Battery info : Get into this item can show all information of battery, including Voltage, Current, Avg Current, Cycle times, Capacity, Remaining Capacity , Full Charge Capacity , Temperature, Max Tempt, Min Tempt , Relate ChgSta , Absolute ChgSta , Max Uncharge Times , Last Uncharge Times , CorVolt-1.

*These information needs to be supported by battery communication.



9. Error Code define

850C can show warning message,  icon shows on the screen, and show error code at the bottom of the screen, error code from 04H~30H, definition see the table below.

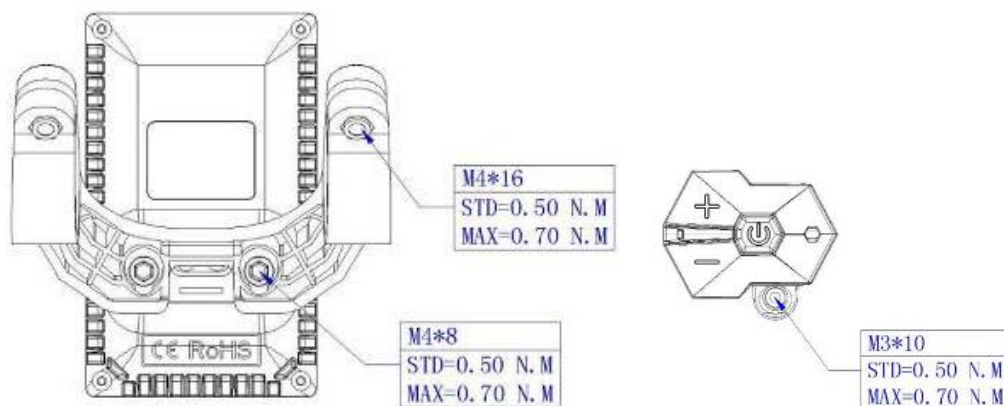
Error Code	Error description	Error diplay
0x01	Normal	No error
0x03	Brake signal	No error
0x04	Throttle on high position	Display 04H on LOGO position
0x05	Throttle error	Display 05H on LOGO position
0x06	Low voltage protection	Display 06H on LOGO position
0x07	High voltage protection	Display 07H on LOGO position
0x08	Motor's hall sensor error	Display 08H on LOGO position
0x09	Phase line of motor error	Display 09H on LOGO position
0x10	Controller over temperature	Display 10H on LOGO position
0x11	Motor over temperature	Display 11H on LOGO position
0x12	Current sensor error	Display 12H on LOGO position
0x13	Battery's temperature sensor	Display 13H on LOGO position

	error	
0x14	Motor's temperature sensor error	Display 14H on LOGO position
0x15	controller's temperature sensor error	Display 15H on LOGO position
0x21	Speed sensor error	Display 21H on LOGO position
0x22	BMS communication error	Display 22H on LOGO position
0x23	Head light error	Display 23H on LOGO position
0x24	Head light sensor error	Display 24H on LOGO position
0x25	Torque sensor error-Torque	Display 25H on LOGO position
0x26	Torque sensor error-speed	Display 26H on LOGO position
0x30	Communication error	Display 30H on LOGO position



10. Assembly instructions

Please pay attention to the screw's torque value, damaged caused by excessive torque is not within the scope of the warranty.



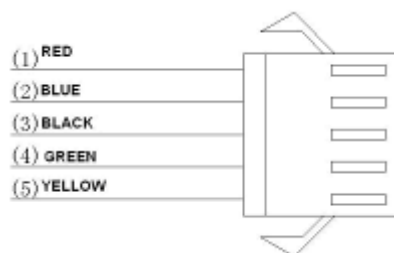
There are 2 directions for the clamp installation, forward or backward.



Clamps suit for 3 size of handlebar, 31.8mm, 25.4mm, 22.2mm, there are transfer rings for 25.4mm and 22.2mm, transfer ring must be assembled with the special directions, pay attention to the green arrow below.



11. Connector descriptions



- 1、 Red wire : Anode(24v/36v/48V)
 - 2、 Blue wire : Power cord to the controller
 - 3、 Black wire : GND
 - 4、 Green wire : RxD (controller -> display)
 - 5、 Yellow wire : TxD (display -> controller)
-

12. Assist level instructions

Assist level can be customized, the highest level is 9, common used assist level see the table below:

3 level	5 level	9 level	
0		0	No power assist
	1	1	
		2	
1	2	3	
		4	
	3	5	
2		6	
	4	7	
		8	
3	5	9	

13. Certification

CE / IP65 (water proof) / ROHS.
