

Specification

April 2023

Product: TFT LCD Display

APT Model: 860CM

Client Model:

Client:

Client Check:

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1 Product model

Model: 860CM

2 Suppliers

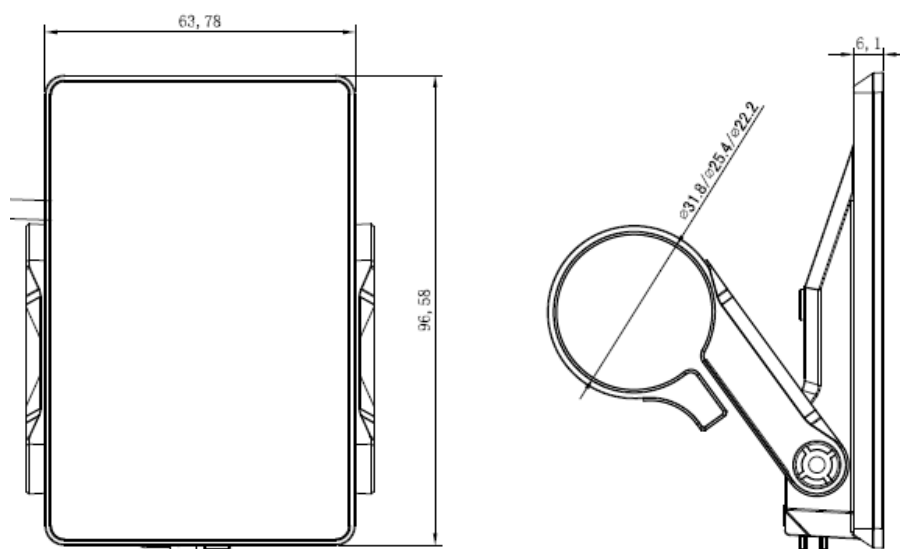
APT (Tianjin) Development Co., Ltd.

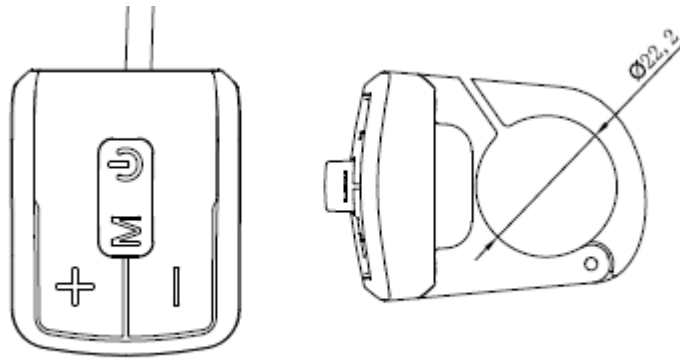
3 Specifications

- 3.5inch TFT screen(IPS 240*320 pixel)
- Wide-voltage range: 24~70V(optional)
- Multi-language support(6 languages)
- Light Sensor
- USB Type-C interface, DC 5V 500mA
- Rated operating current : 40mA, Maximum output current to controller: 200mA, off-leakage current <math>< 1\mu\text{A}</math>
- Operating temperature : $-20\sim 70^{\circ}\text{C}$, Storage temperature $-30\sim 80^{\circ}\text{C}$
- IP65
- EN15194/2017
- RoHS

4 Dimensions and Material

Shell and bracket is made with ABS+ PC, panel is tempered glass.

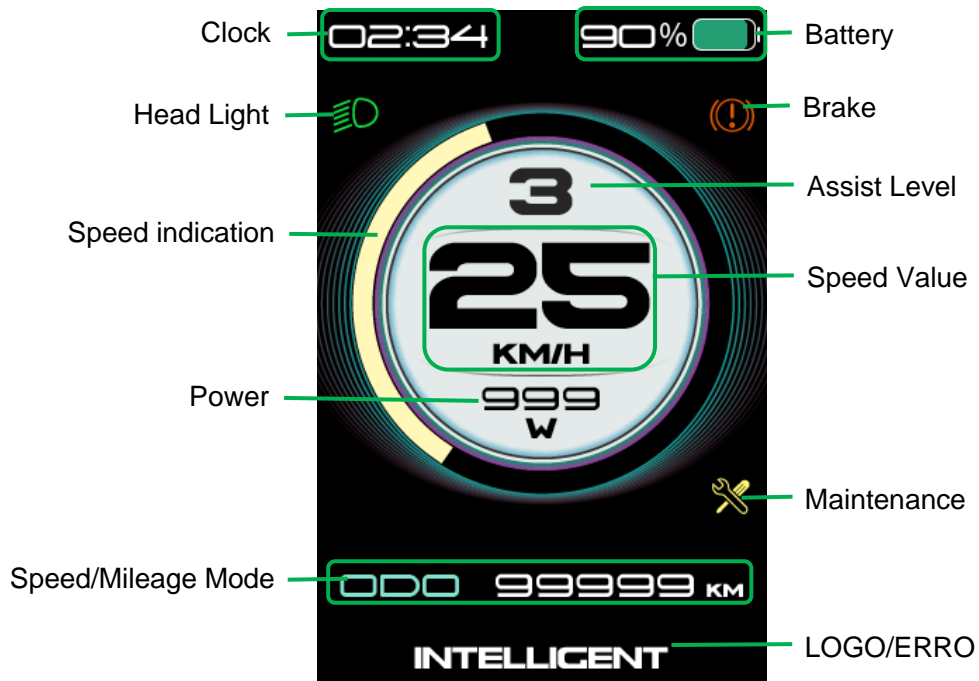




5 Features

- **3.5inch TFT screen (IPS)**
- **6 languages:**
German, French, English, Italian, Spanish, Czech are supported.
- **USB charging port: 5V 500mA**
- **Light Sensor**
- **Independent button, easy to operate**
- **Speed display:** Speed (Real-time), AVG Speed, MAX Speed
- **Metric / Imperial**
- **Smart battery indication:** Capacity (percentage) or Voltage
- **Mileage:** Odometer, Trip distance, Range
- **Clock:** Built in battery, clock keeps running when power off
- **Brightness setting:** Day and Night Brightness can be set independent
- **9-level Assist:** 3-level/5-level/9-level/UBE optional.
- **Power indication:** Real-time Power(W) or Current(A).
- **Errors Code tips**
- **6km walking**
- **Firmware upgrade:** Upgrade the Logo individually

6 Main page






Modern



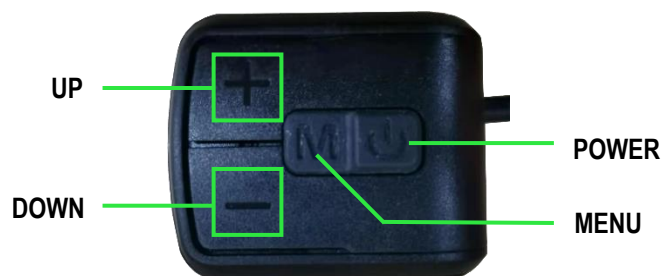
Classics

- **Clock:** 12hour or 24hour clock
- **Head Light:** Head Light on/off.
- **Power:** Real-time Power or Current.
- **Power indication:** The maximum indication can be set to 1000W or 2000W

according to the output of the battery, and the display of the actual power value is not affected when the power value exceeds the maximum indication.

- **Smart battery Power indicator:** Provide a reliable battery Power indicator.
- **Brake:** Show  when braking.
- **Assist Level:** 4 modes optional (3/5/9/UBE)
- **Speed Value:** Real-time Speed, Km/h or MPH.
- **Speed indication:** When the speed limit is less than 40km/h, the maximum indicator is 45; when the speed limit is more than 40km/h, the maximum indicator is 60(The Classics mode is 90); if the real-time speed exceeds the maximum indicated, its display is not affected.
- **Speed/Mileage Mode:** AVG Speed, MAX Speed, Odometer, Trip distance, Range, Riding time.
- **Maintenance Icon:** When Odometer reached presetting (Default 5000KM),  will be showed, reminding maintenance. This function is reserved and inactivated by default.
- **Errors Code:** Show  when checking errors.
- **LOGO**

7 Functional Description



7.1 Power On/Off

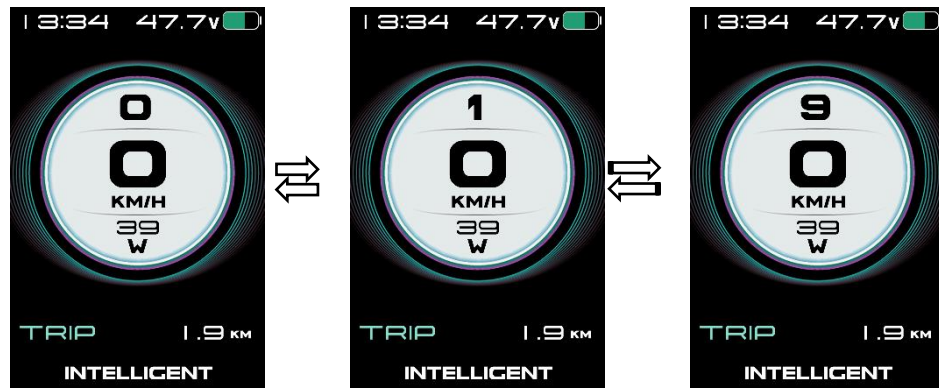
Pressing **POWER** button for 2 seconds, you can turn on/off the display. The Display can automatically turn off when there is no operating & riding for 5 minutes. (Length of time can be set, refer to 8.1.4 'Auto Power off Setting')

*Input pattern in first if pattern unlock was activated.

*Display will be locked for 60 seconds after 3 times failed attempt.

7.2 Assist level

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



Assist level

7.3 Speed & Mileage mode

Click **MENU** button can change items on Main Page, sequence as below:

Modern mode page: TRIP→TIME→ODO→AVG Speed→MAX Speed→RANGE→TRIP.



Speed/Mileage Mode

Classics mode page: TRIP→ODO→RANGE→TRIP, TIME→AVG Speed→MAX Speed→TIME.

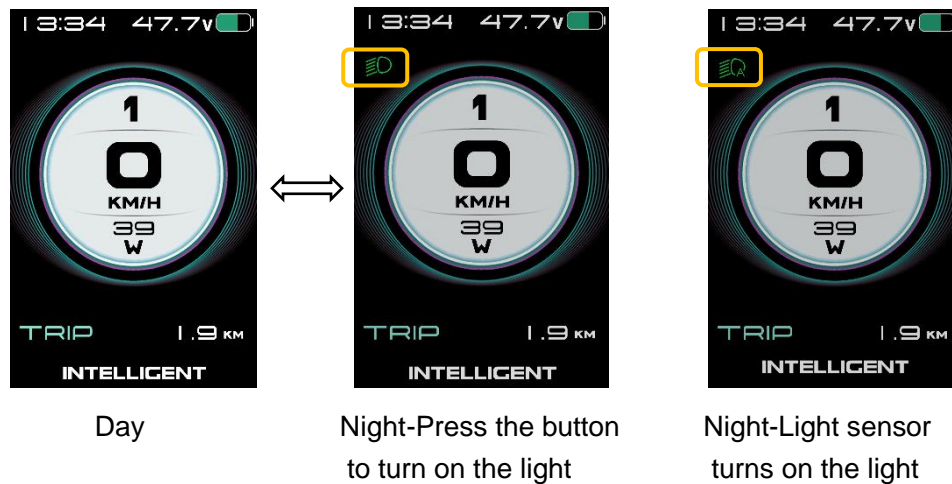


* If there is no operation for 5 seconds, right item will restore to Time automatically.

7.4 Headlight / Display Mode/ Light Sensor

Press and hold **UP** button for 2 seconds can turn on/off headlight, display will switch to the corresponding mode (Day or Night).

Build in light sensor can turn on/off headlight automatically according to external brightness.



- * Light sensor's sensitivity can be customized. Refer 8.1.3 Bright Setting.
- * 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.
- * If you operated headlight through button, light sensor will be deactivated until reboot.

7.5 Walking mode (6km)

Press and hold **DOWN** button for 2 seconds can get into walking mode, show 'P' on screen, out of walking mode when releasing button.



Walking Mode

7.6 Data cleanup

Press and hold **UP** & **DOWN** button together for 1 second can clean temporary data (TRIP, Riding-Time, AVG SPD, MAX SPD data).

- * Temporary data is automatically saved when power off. Abnormal power outage will cause data lost.
- * Restore Factory Mode (advanced settings in Menu Page) can clear temporary data (TRIP, Riding-Time, AVG SPD, MAX SPD, Kcal, Chart data, MENU settings) except ODO.
- * ODO will reset to zero over 99999km. TRIP will reset to zero over 9999.9km.

7.7 USB charging port

Set USB port on/off. USB provides charging for mobile devices, DC 5V 500mA.

8 Menu Page

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

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

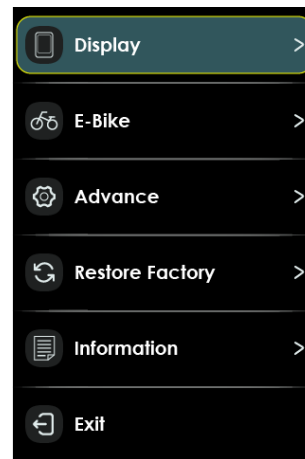
* For safety reason, display will be locked on Main Page when riding (speed \geq 2 km/h), function of MENU will be deactivated.

* Display didn't save setting until click OK to confirm.

* Display doesn't quit MENU through pressing **MENU** button.



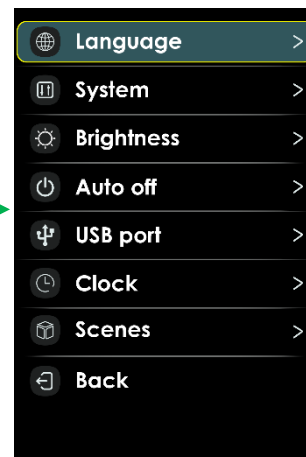
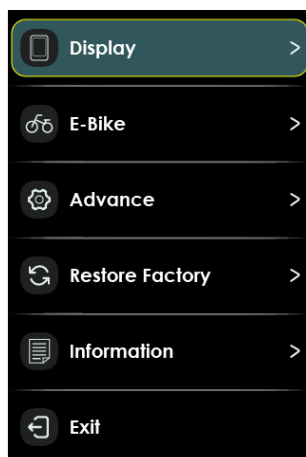
Main Page



Menu Page

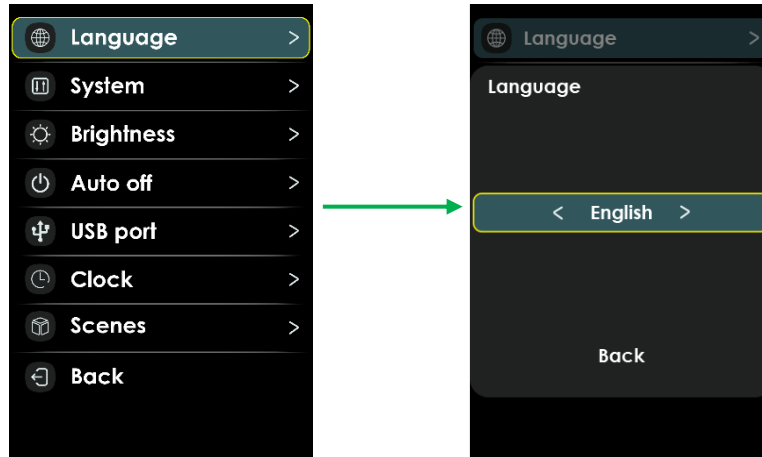
8.1 Display settings

Display settings include several items: Language, System, Brightness, Auto off, USB Port, Clock, Scenes.



8.1.1 Language

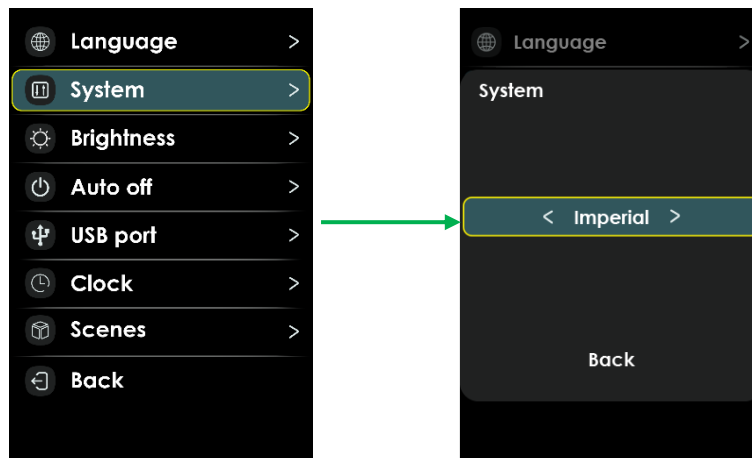
6 languages are supported: German, French, English, Italian, Spanish, Czech. Default is English. Select language then click “Back” to confirm.



Language

8.1.2 System

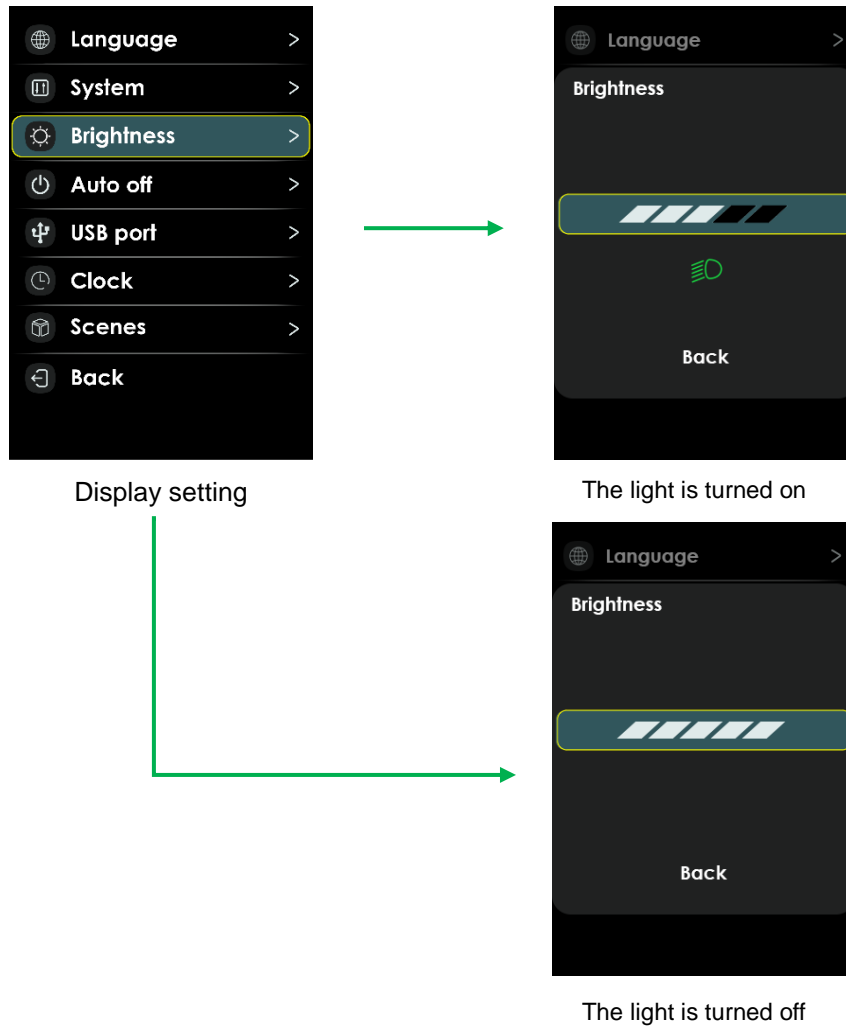
Select Metric and Imperial.



Metric and Imperial

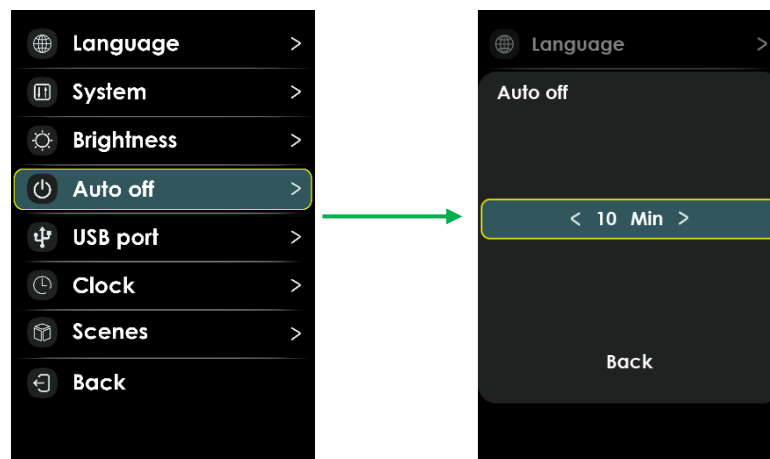
8.1.3 Brightness

Press **UP/DOWN** button to change brightness of backlight, 1 is darkness, 5 is brightness.



8.1.4 Auto off

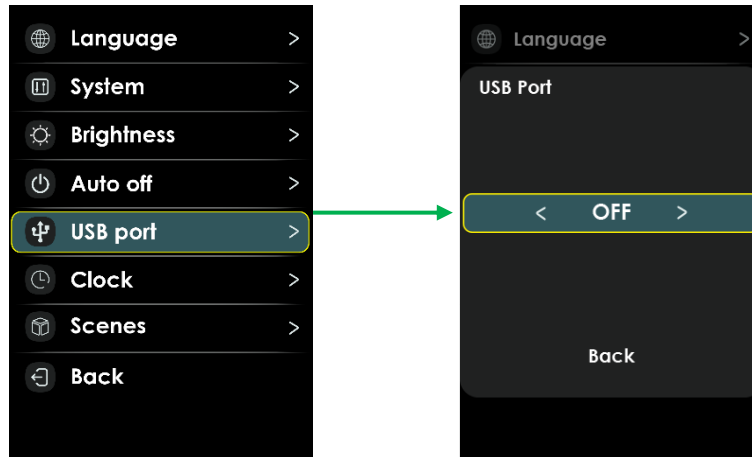
This item enables to set the automatic shutdown time of the display, from 1 to 10min. Default value is 5 minutes, represents display shut down when there was no operation and riding for 5 minutes. OFF indicates that the display disables automatic shutdown.



8.1.5 USB Port

You can set ON/OFF of USB port through **UP/DOWN** button.

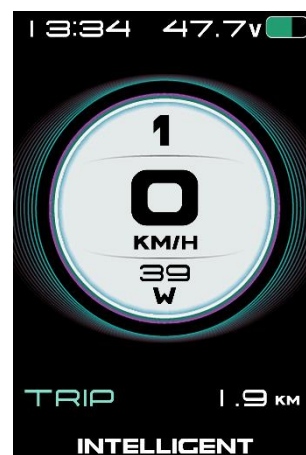
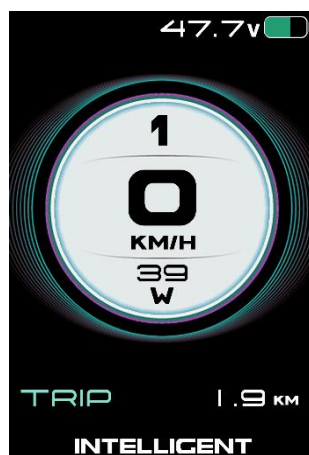
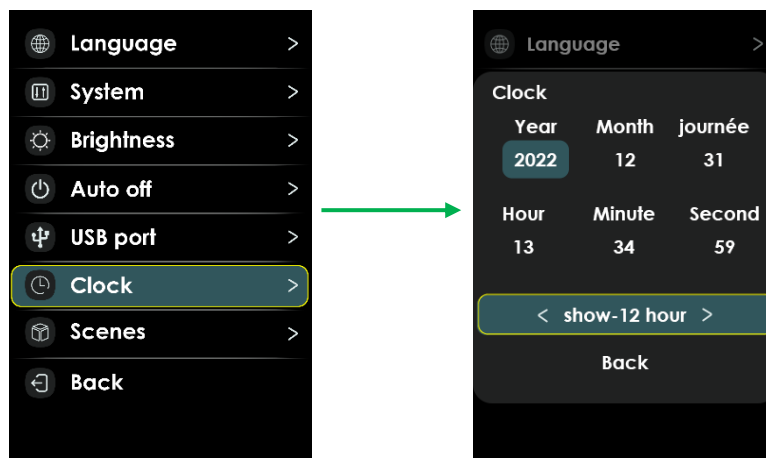
USB port: Type-C, 5V/500Ma



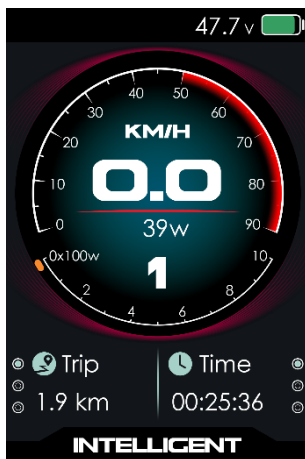
USB Port

8.1.6 Clock

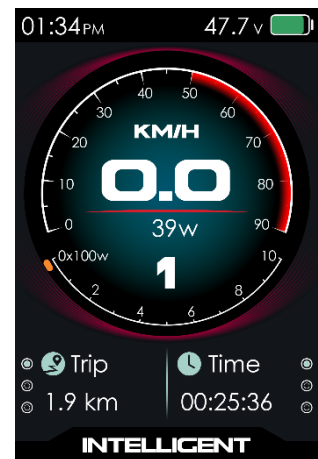
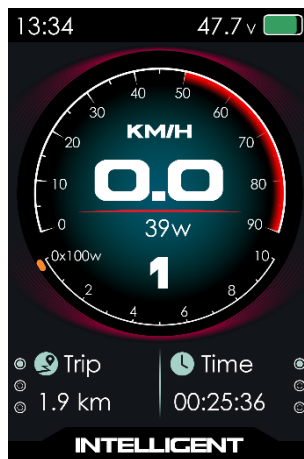
This item set date and time. You can choose Show-12 hour, Show-24 hour or hide Clock on Main Page through **UP/DOWN** button.



Modern mode page-Hide



Modern mode page-Show-12 hour/24 hour



Classics mode page-Hide

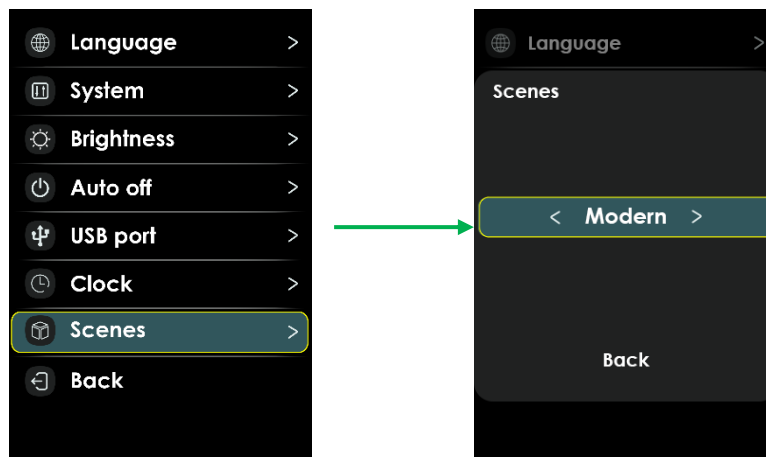
Classics mode page-Show-24 hour

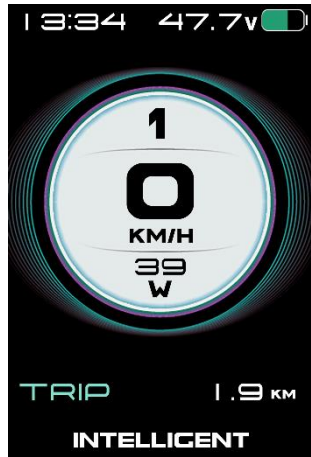
Classics mode page-Show-12 hour

* Note: When display was powered off, internal Button Battery can keep clock running. When display is power on, Button Battery will be charged by external battery. Clock may slow or stop if Button Battery is low, please charge the battery as follows: Set “Automatic shutdown” to “OFF” (Disable power off automatically), keep the display power on for 72 hours. Full charged Button Battery can keep clock running at least 3 months without charged.

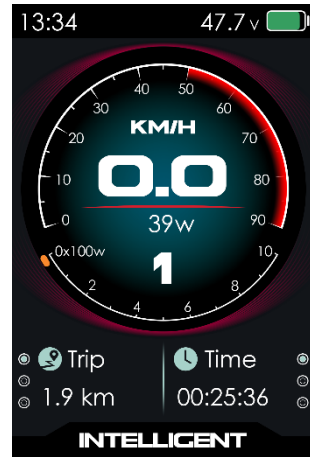
8.1.7 Scenes

Support Modern or Classics mode.





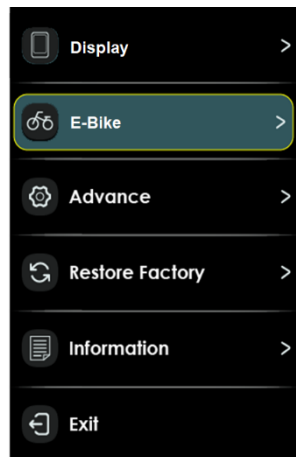
Modern mode



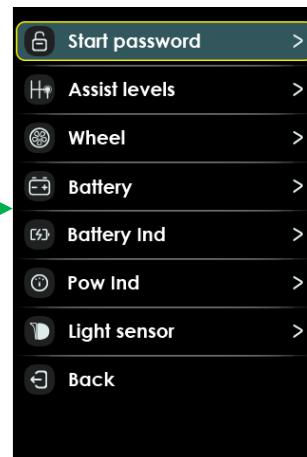
Classics mode

8.2 E-bike Settings

E-bike settings include several items: Start password, Assist levels, Wheel, Battery, Battery Ind, Pow Ind, Light sensor.



MENU

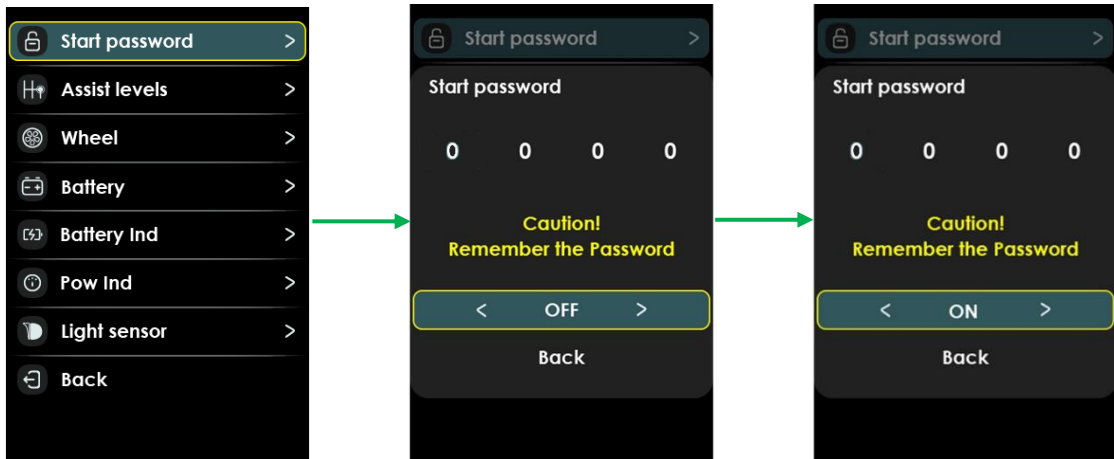


E-bike settings

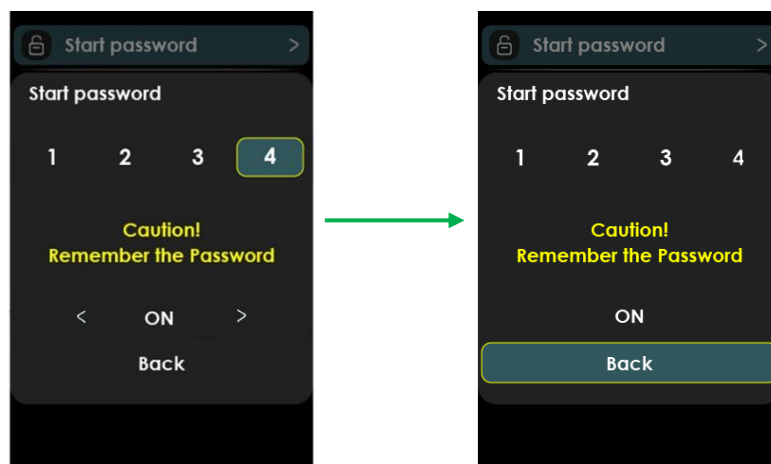
8.2.1 Start password

The start password includes two parameter settings, Start password、OFF/ON.

If you had set start input **ON**, you must input right password before power on.

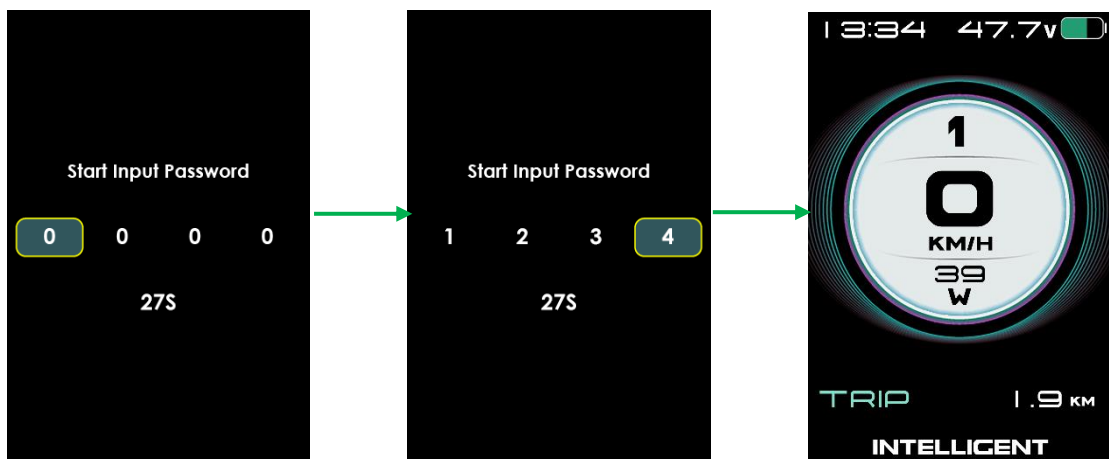


Turn on the start password function



Start password setting page

You need to input the right password before start with 30 seconds.



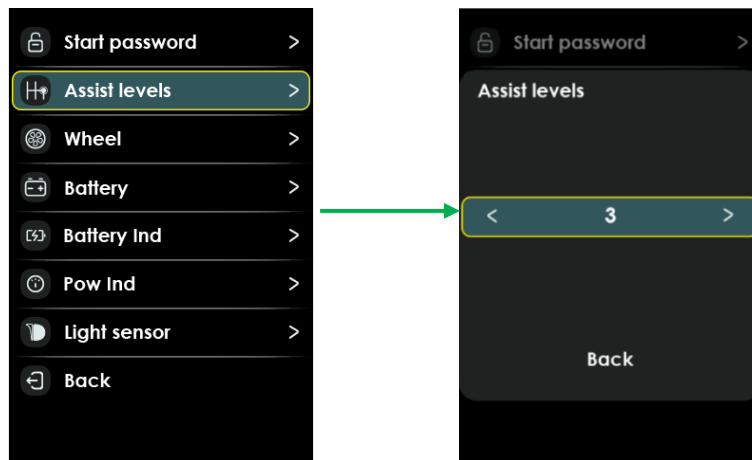
The boot page after setting the start password

* Display will power off automatically if the password was wrong. Press and hold the **POWER** button to shut down while entering the password.

* Display will power off automatically if the password was entered incorrectly 3 times.

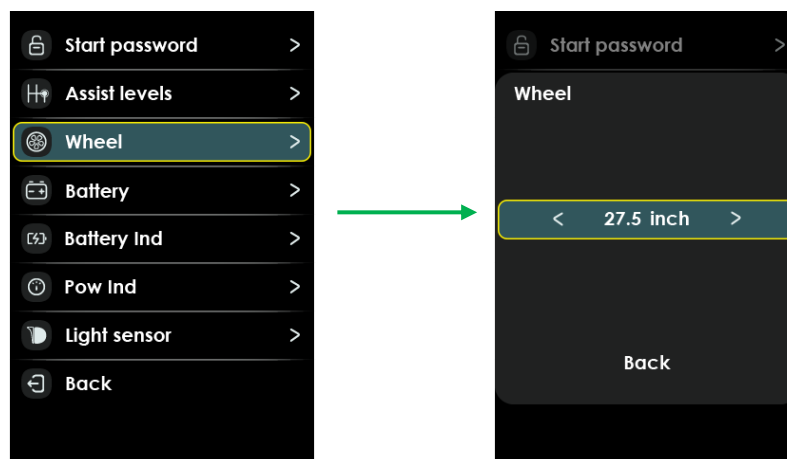
8.2.2 Assist levels

This item can select assist levels, options are 3/5/9/UBE(6).



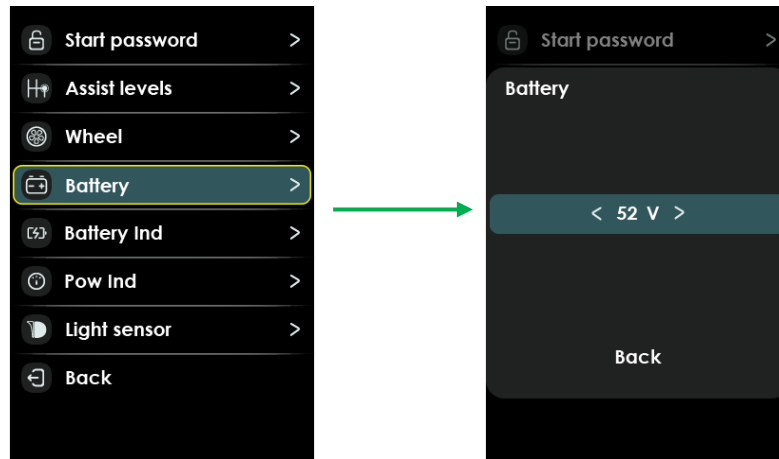
8.2.3 Wheel

This item can select wheel diameter, including 16/18/20/22/24/26/27/27.5/28/29 inch. Incorrect wheel diameter selection can lead to abnormal speeds.



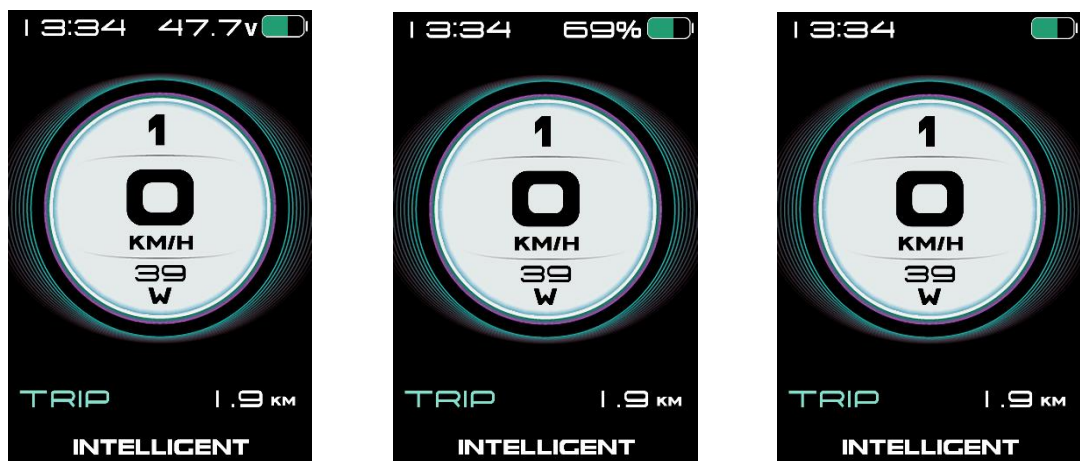
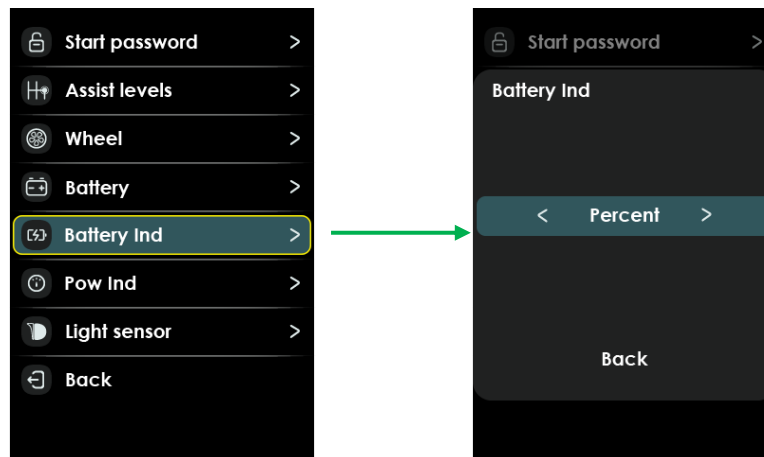
8.2.4 Battery

This item can select battery voltage setting, including 24/36/48/52V. This item is unused in Bafang system.



8.2.5 Battery Ind

This item can select battery Ind setting, including OFF/Percent/Voltage.



Voltage

Percent

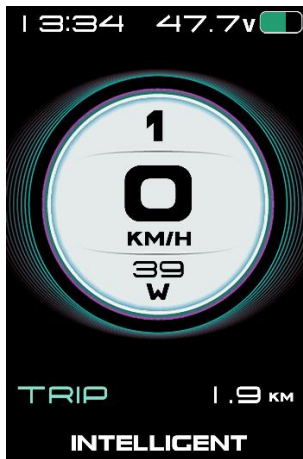
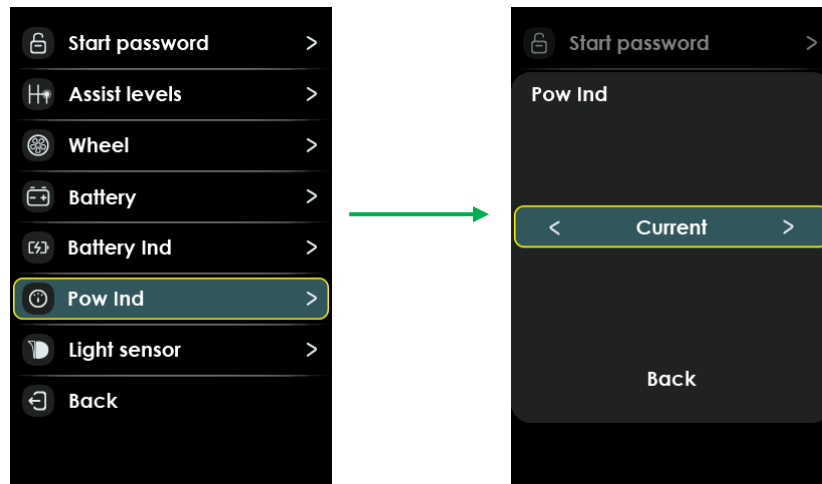
OFF

Note: The voltage is the remaining voltage or percentage of the battery.

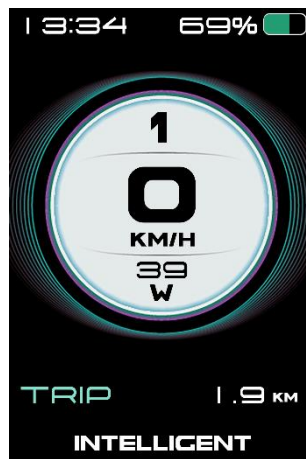
8.2.6 Pow Ind

This item can select power indicator on Main Page, 'OFF', 'Output Power(W)' and

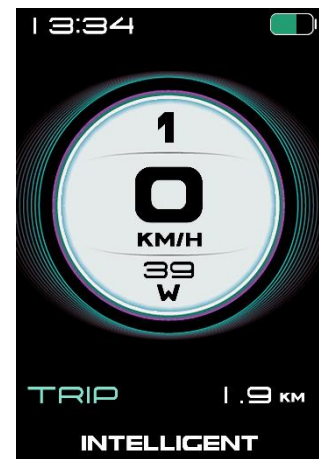
'Current(A)'.



Output power (W)



output current (A)



Power (OFF)

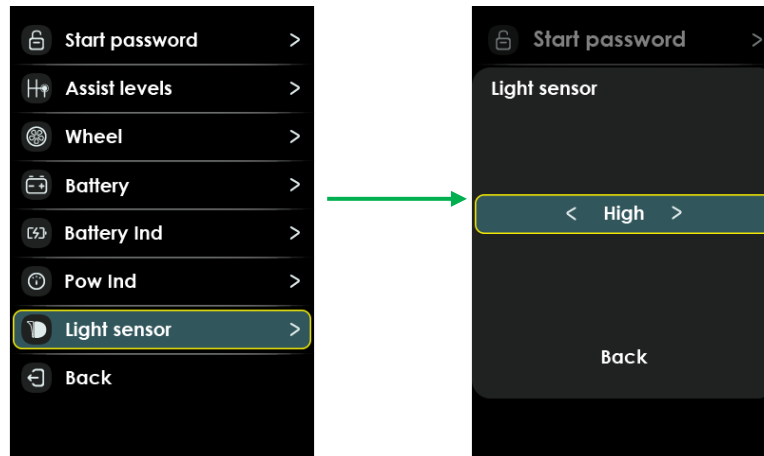
Note: Power indicator represent battery's output power (current), not motor.

8.2.7 Light sensor

This item can select Light sensor, High/Middle/Low/OFF.

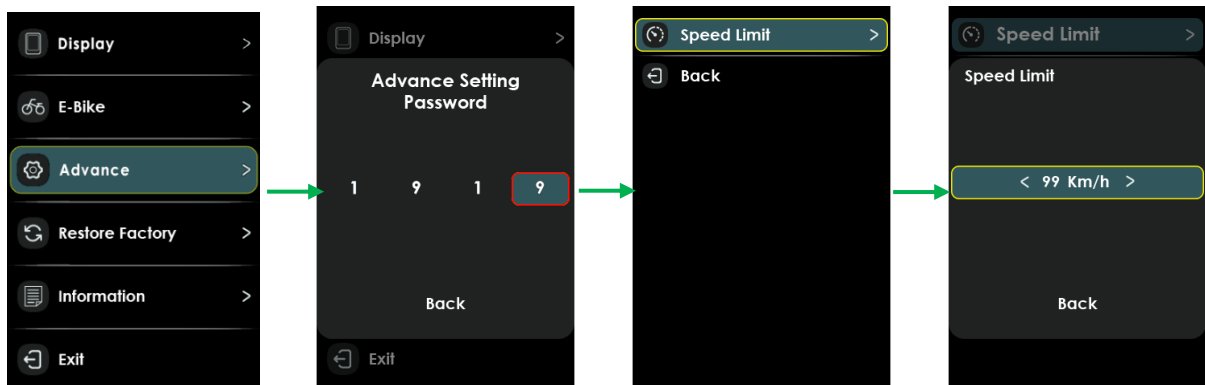
Low: Represents that the sensor is activated in relatively dark light.

High: Represents that the sensor is activated in relatively bright light.



8.3 Advanced setting

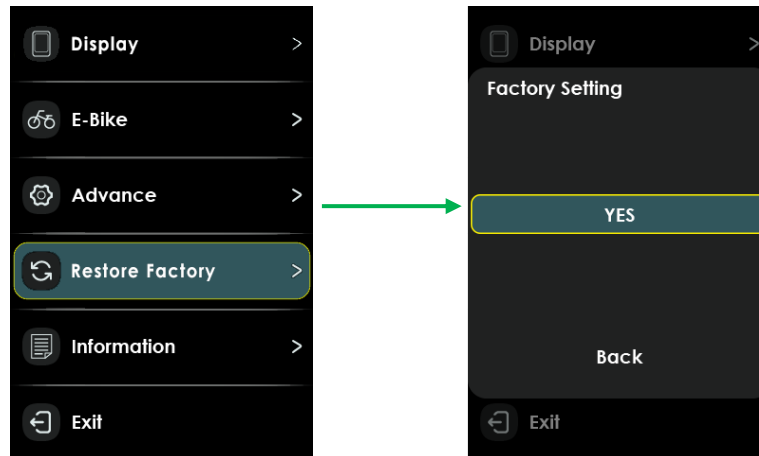
Advanced settings have password to prevent illegal modification, default password is '1919', password may be different according to request. Input correctly password to enter advanced setting page, where you can adjust the speed limit, range 10km/h ~ 60km/h、99m/h (6.2Mile/h ~ 37.3Mile/h、61.5 Mile/h).



Note: The maximum speed is limited by the motor and controller, and it is not necessarily possible to reach the speed limit setting value.

8.4 Factory Setting

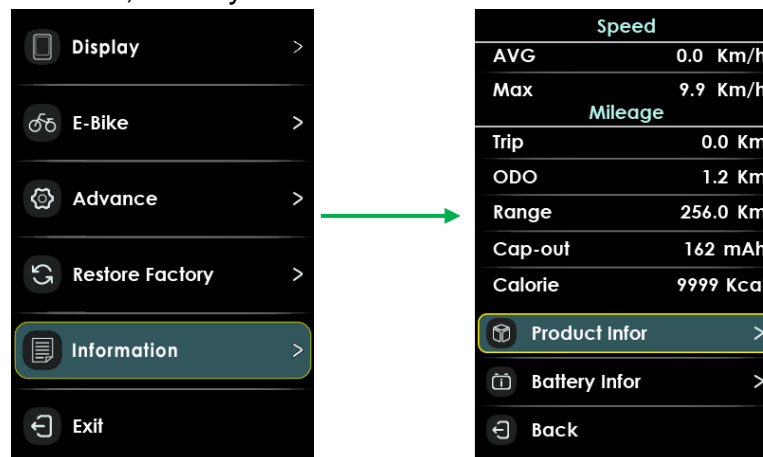
Select 'YES' will restore all setting to factory defaults.



Note: ODO and CLOCK data are not cleared.

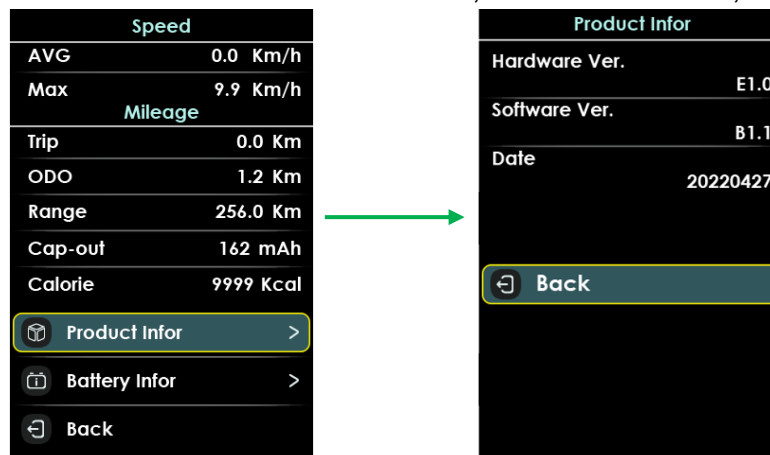
8.5 Information

The information display interface includes: Speed and Mileage Information, Product Information, Battery Information.



8.5.1 Product Information

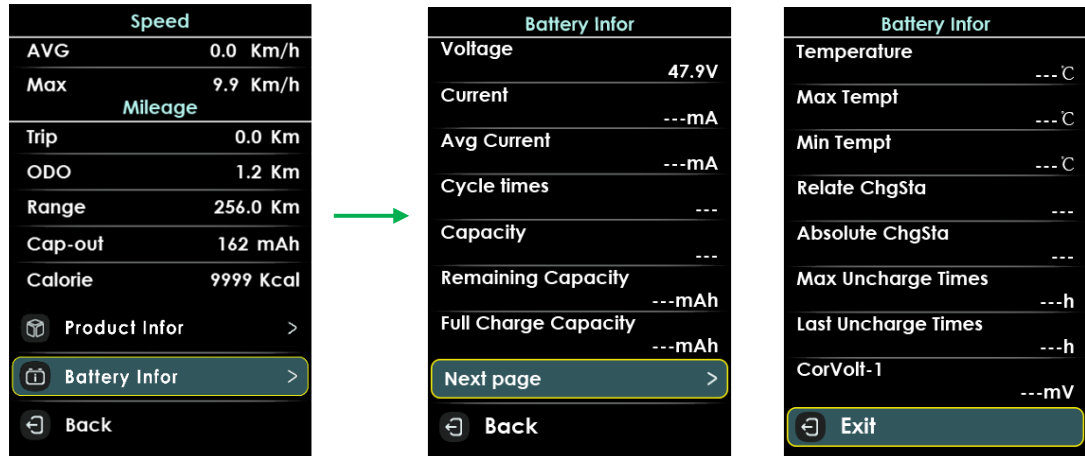
Product Information show Hardware Version, Software Version, Date.



Product information

8.5.2 Battery Information

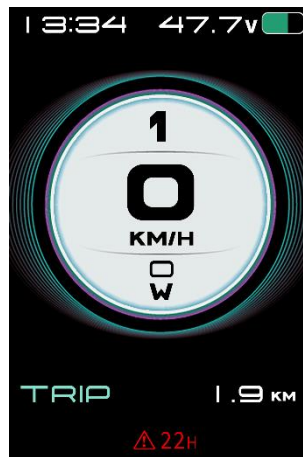
Battery Information can show voltage, Current, Avg Current, Cycle times, Capacity, Remaining Capacity, Full Charge Capacity, Temperature, Max Tempt, Min Tempt, Relate Chgsta, Absolute Chgsta, Max Un-charge Times, Last Un-charge Times, CorVolt-1.



Battery Information

9 Errors code

Display shows error code and at the bottom of the screen when system checked abnormal.



Error code prompt page

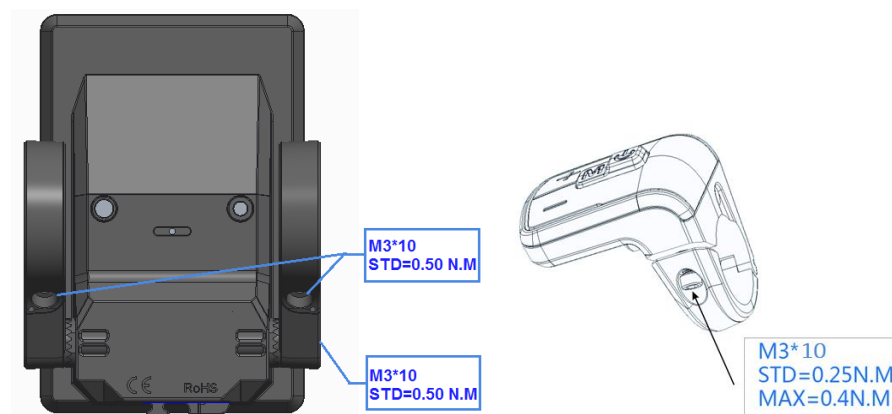
| Error Code | Error description | Handle |
|------------|------------------------------|---|
| 04 | Throttle error | Check throttle and connection |
| 05 | Throttle turn back fault | Check throttle and connection |
| 07 | Overvoltage protection | |
| 08 | Hall error | Check the hall connection |
| 09 | three-phase power error | Check three-phase power line connection |
| 10 | The controller is overheated | Stop using 10 minutes to restart |
| 11 | Motor overheating | Stop using 10 minutes to restart |
| 12 | Current sensor error | Check the sensor connection |

| | | |
|----|---------------------------------------|----------------------------------|
| 13 | battery temperature abnormality | Stop using 10 minutes to restart |
| 14 | Motor temperature sensor is abnormal | Check the sensor |
| 15 | Controller temperature sensor failure | Check the sensor |
| 21 | Speed sensor fault | Check the sensor |
| 22 | BMS Communication Error | Check the cable connection |
| 23 | Headlight error | Check the cable connection |
| 24 | Headlight sensor error | Check the cable connection |
| 25 | Torque sensor signal error | Contact the supplier |
| 26 | Torque sensor speed error | Contact the supplier |
| 30 | Communication Error | Check the cable connection |

10 Assembly instructions

Please pay attention to the torque value, exceeding the maximum torque can damage the part.

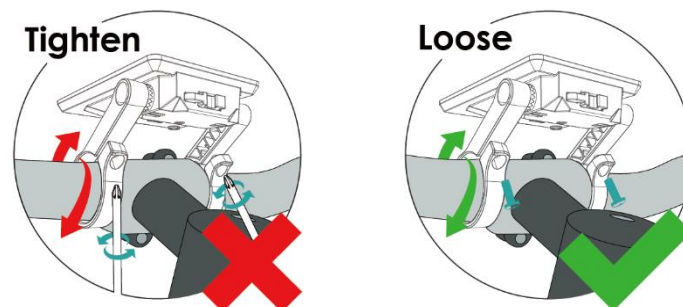
Electrical or pneumatic tools is not recommended.



There are 3 pairs of rubber ring to match different handlebars, choose matched rings for assembly.

11 Install and use precautions

Do not adjust viewing angle before loose the screws.



12 Copyright Notice

Questions about your e-bike, please contact with dealer firstly.

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website : www.aptdevelop.com