



SW102 Display technical specifications

Product Name: Intelligent OLED display

Part Number: SW102

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A. Introduction

1 Product name and model

Intelligent OLED display, model: SW102

2 Product Introduction

Minimalist design, process without screw assembly

Super contrast 1.3-inch monochromatic OLED screen

Excellent outdoor design with IP65 waterproof

Micro USB serial communication port, convenient for maintenance services

Bluetooth function is optional, which adapt for mobile phone APP

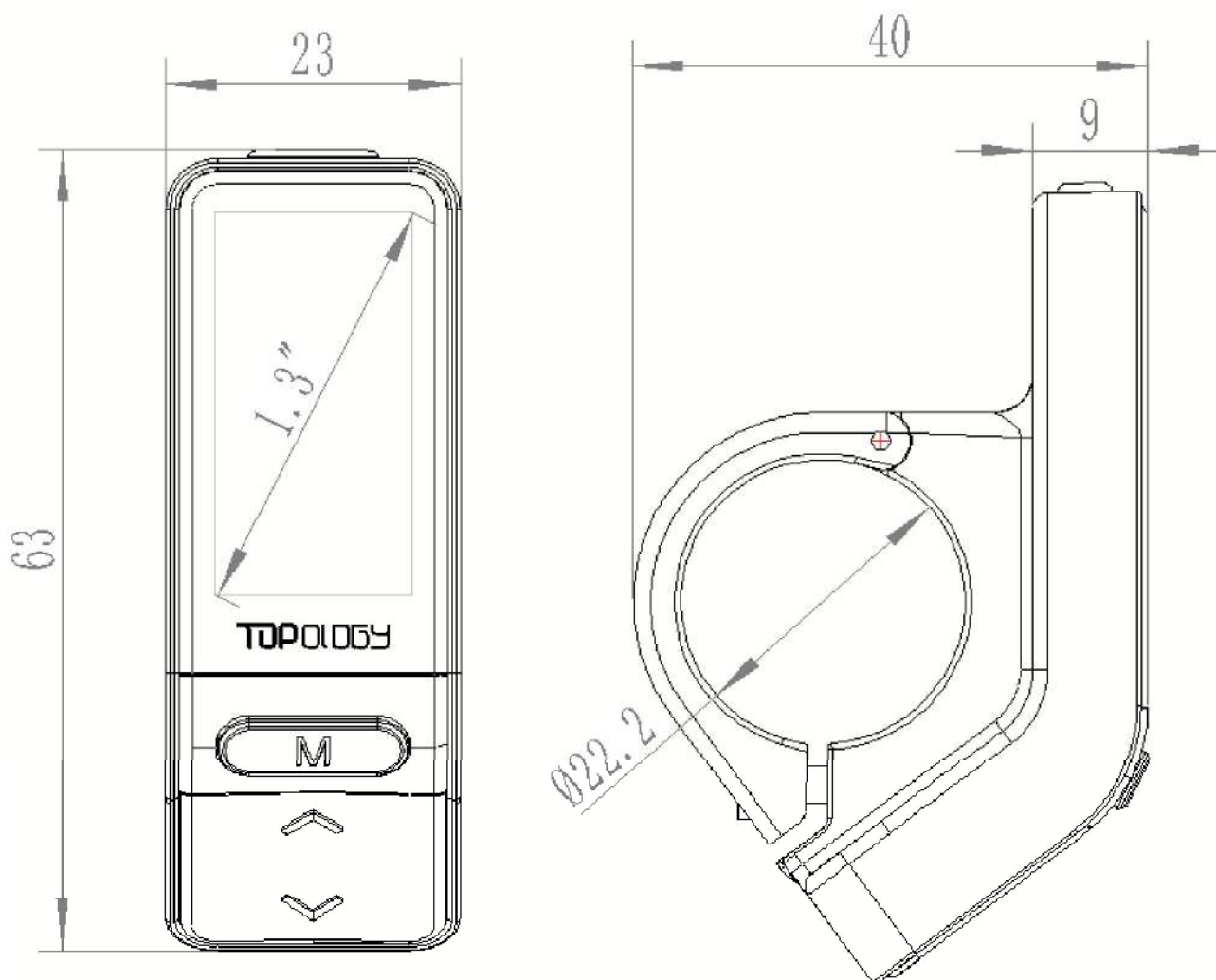
3 Range of application

Suitable for an electric power assisted bicycle in accordance with the standard of EN15194

4 Appearance and size

The material of this product shell is ABS + PC. And the material of the window is 2.5D tempered glass.





5 Display coding rules



S/N: C11701A0010001

As shown as above picture, C1 is the manufacture factory code
 1701 is the manufacture year and week
 Number is the hardware version
 001 is the firmware version number
 0001 is the product serial number

B. Product manual

1 Specifications

- ① Power supply: DC 24V/36V/48V
- ② Rated current: 12mA
- ③ Shutdown leakage current: <1uA
- ④ Screen specification: 1.3"OLED (64*128 dots)
- ⑤ Communication method: UART (default)
- ⑥ Operating temperature: -20°C ~ 60°C
- ⑦ Storage temperature: -30°C ~ 80°C
- ⑧ Waterproof level: IP65

2 Functional overview

- ① Four buttons, easy to operate
- ② Use the password to turn on
- ③ Km / miles
- ④ Speed display: Real-time speed (SPEED) maximum speed (MAX) average speed (AVG)
- ⑤ Five stalls of power assist control: 0-4 levels (OFF-ECO-TOUR-SPORT-TURBO)
- ⑥ Six levels of electricity instructions: 1-5 levels of power and under voltage prompts
additionally it provides battery BMS information.
- ⑦ Headlight indicator: Headlight on/off status indication (need information from controller)
- ⑧ Mileage display: Subtotal mileage (TRIP) total mileage (ODO)
- ⑨ Riding time (TRIP TIME) display
- ⑩ UART communication port (Micro USB)
- ⑪ 6km/h walk assist function for system maintenance and parameter
- ⑫ Error code indication

3 Installation

① Open the display lock clip and set the display in the left handlebar (standard handlebar size: $\Phi 22.2$). Adjust to a required position, tighten and fix the screw with an M3 hex key. Tightening torque: 0.8N.m.*Note: Damage caused by excessive torque is not covered by the warranty.

4 Interface

4.1 Boot interface can be customized as required



① The above will show for 2 seconds when you turn on the display

4.2 Basic interface



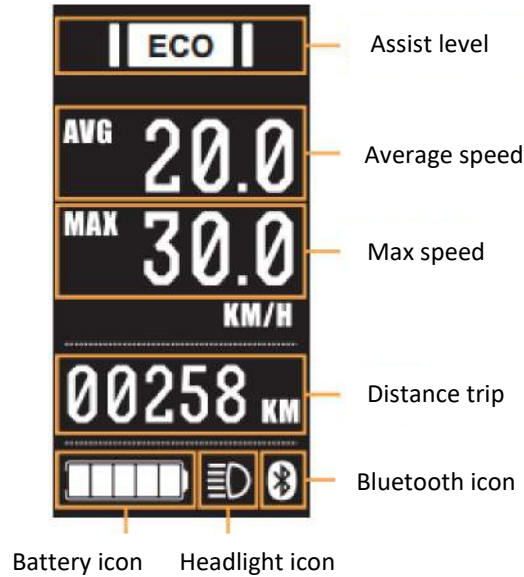
- ① Power assist level and walk mode: 0-4 files assist level, power from low to high are: OFF, ECO, TOUR, SPORT, TURBO and WALK mode.
- ② Current speed and unit show the current riding speed.
- ③ Subtotal mileage and unit is accurate to one after the decimal point, maximum is 999.9.
- ④ Power indicator shows 1-5 levels of power and under voltage. Then icon blinks when under voltage.
- ⑤ Headlight icon shows when the headlight is on.
- ⑥ Bluetooth indicator shows when the mobile phone is connected.

4.2 Function interface I



① The riding time shows the ride duration. The rest of the information is the same as basic interface.

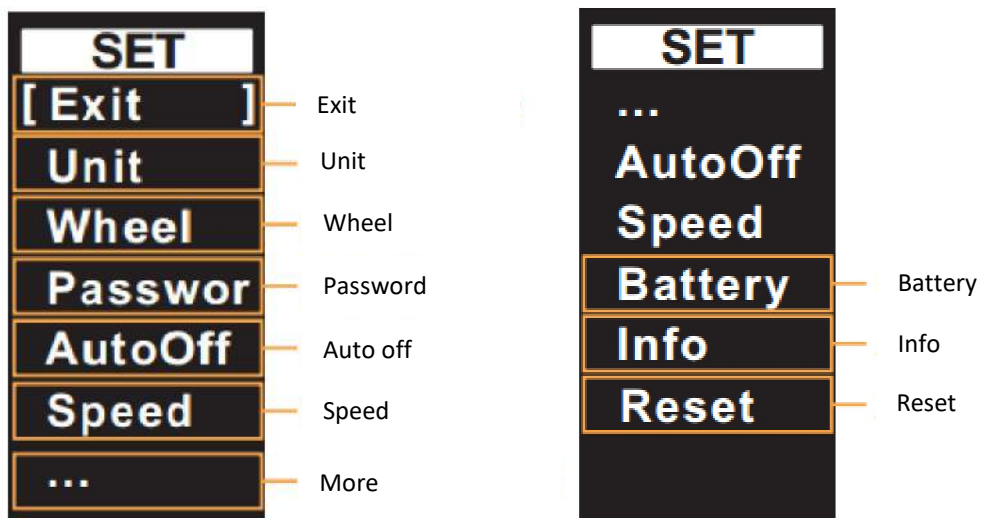
4.3 Function interface (II)



- ① Average speed (AVG) shows the average speed of the ride
- ② Maximum speed (MAX) shows the maximum speed of the ride
- ③ Total mileage ODO shows the mileage of the whole ride, maximum is 9999km.

The rest of the information is the same as the basic interface.

4.4 Setting interface



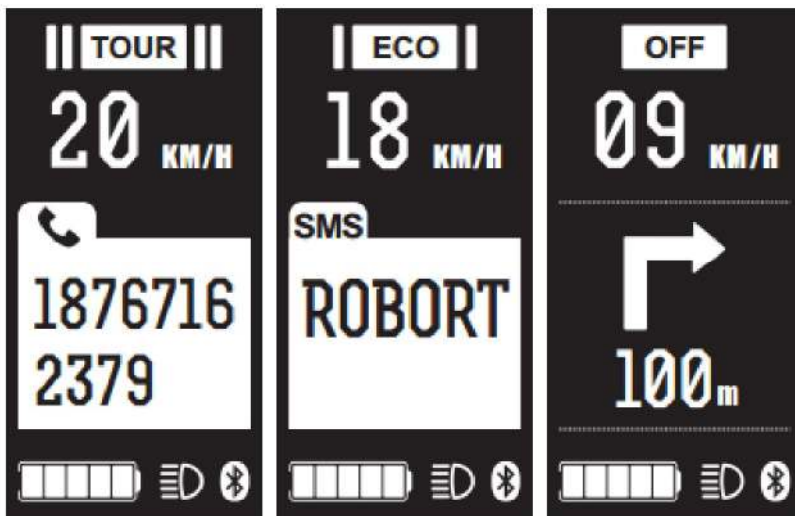
- ① Setting interface prompt, current interface is for setting
- ② Exit item and select required option: short press the function option to exit the setting interface and return to the basic interface; [] select menu.

- ③ Unit Settings: unit settings of speed and mileage
- ④ Wheel diameter information: wheel diameter information adapted for the display
- ⑤ This password Settings: user's password function can change the password, shut down the operation or turn off the defaulted setting.
- ⑥ Automatic shutdown: after 5 minutes (the default) no operation on the display, it will shutdown automatically.
- ⑦ Speed limitation information: The allowed maximum speed information of the bike
- ⑧ Battery information: The information about the battery
- ⑨ Hardware information: The information about the hardware
- ⑩ Reset: Reset to factory settings




4.5 Mapping the mobile phone (connect to the mobile phone APP)

When the Bluetooth icon is displayed the mobile phone is connected with the APP.

- ① Setting the parameter of the display through mobile phone APP
- ② Navigation icon mapping display function



5 Definition of buttons

Turn on/off: , Function button: , Adjust button+: , Adjust button-: 

6 Operation

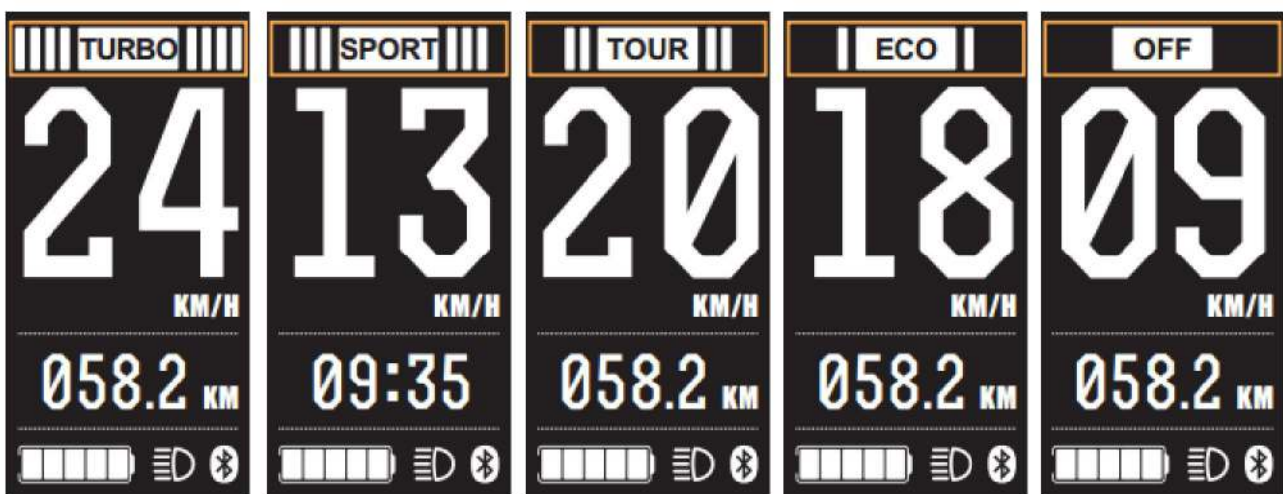
6.1 Turn on/off

Hold down the Power button when the display is off. Display shows the boot interface and enters the basic interface to start.

Hold down the power button for 2 seconds when the display is turned on to power down the interface. If the bike is not operated within 5 minutes the display will automatically power down.

6.2 Assist

Modes: OFF/ECO/TOUR/SPORT/TURBO. Default ECO mode when display is turned on. OFF means no assist power. (assist mode icons as below)



TURBO Mode

SPORT Mode

TOUR Mode

ECO Mode

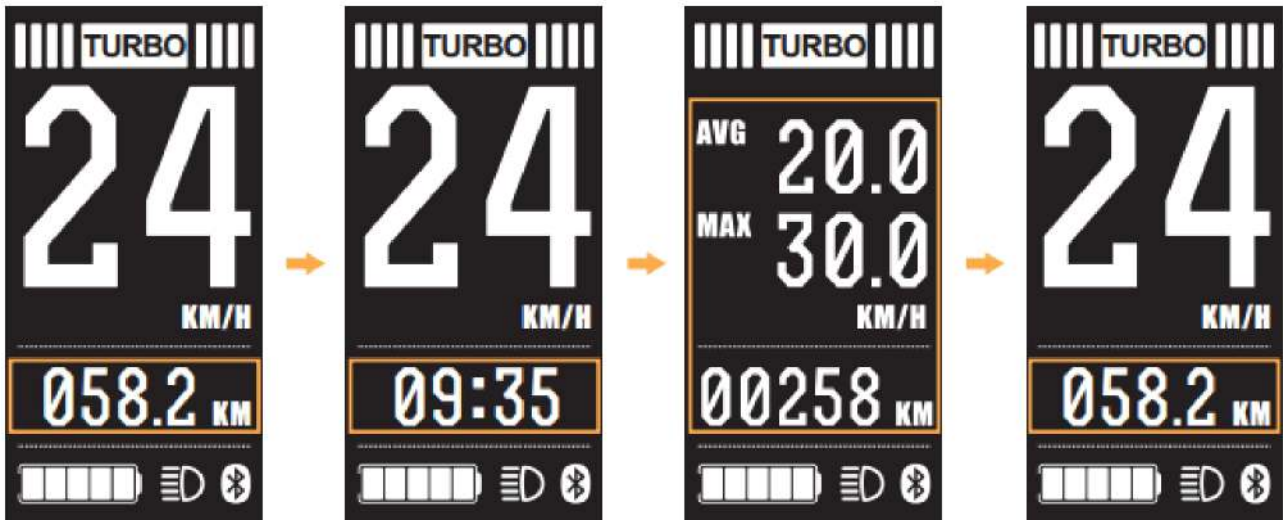
OFF Mode

6.3 Display information switch


Information switches from trip miles/ riding time/ average speed/ max speed/ total mileage by pressing

M when the display is on. It shows the distance traveled in trip miles (TRIP) ->riding time (TRIP TIME)->average speed (AVG), maximum speed (MAX), total mileage (ODO).

Mode switch as below pictures:





6.4 Walk assist mode

Hold the down arrow for 2 seconds, the bike will enter the walk assist mode. When  is shown

The bike is in walk assist mode. Walk assist mode icon as below.

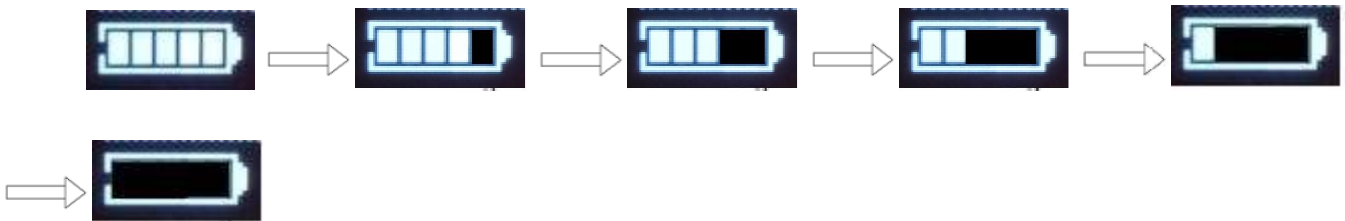


6.5 Headlight on/off

Long press of the  button for 1 second, this will activate the operation of the headlight. Headlight icon will be displayed when in operation. Another long press of the  button for 1 second will de-activate the headlight function.

6.6 Power indicator

When the battery works normally the battery power shows 5 levels according to the battery capacity. When the battery power reaches the under-voltage warning value, only the frame of the battery icon is displayed and will flash to remind the user to charge immediately. The battery power is shown as below:



Percentage of battery power ©

| No. | Percentage on the display(SOC) | Level on the display | Voltage (24V) | Voltage (36V) | Voltage (48V) |
|-----|--------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 | $C \leq 5\%$ | outer border | $U \leq 23.1$ | $U \leq 33$ | $U \leq 42.9$ |
| 2 | $5\% < C < 15\%$ | 1 level power | $23.1 < U < 24.5$ | $33 < U < 34.7$ | $42.9 < U < 45.1$ |
| 3 | $15\% \leq C < 35\%$ | 2 level power | $24.5 \leq U < 25.1$ | $34.7 \leq U < 35.8$ | $45.1 \leq U < 46.5$ |
| 4 | $35\% \leq C < 55\%$ | 3 level power | $25.1 \leq U < 25.6$ | $35.8 \leq U < 36.7$ | $46.5 \leq U < 47.5$ |
| 5 | $55\% \leq C < 75\%$ | 4 level power | $25.6 \leq U < 27$ | $36.7 \leq U < 38.5$ | $47.5 \leq U < 50.1$ |
| 6 | $C \geq 75\%$ | 5 level power | $U \geq 27$ | $U \geq 38.5$ | $U \geq 50.1$ |

7 User settings

Setting items: unit, turn on password, wheel diameter, battery information, auto shut off time, system information, reset factory settings.

(Information, *battery information, time period of automatically shut down, *system information, reset to factory setting. (* means fixed items, do not provide user option to change)

7.1 enter setting status

1. Within 10 seconds of the display being turned on, hold down the **M** button for 3 seconds to enter the data setting interface, on this status users can set and view the parameters of the display.
2. Hold down the M button for 3 seconds to exit and save the setting, select (EXIT) on the setting menu, hold down M briefly to exit and save the settings.
3. The user interface will revert to normal interface after no operation after 10 seconds in the settings interface.
4. The up and down arrows will toggle between setting items.

7.2 Unit setting

Press the up and down arrows to select setting item in the unit setting interface. Briefly press the M button in the exit interface to return to setting interface.

setting interface. Press M in KM/Mile file to switch KM Mile unit.

Km : The unit of trip mileage and total mileage is Km. The unit of current speed, average speed;

maximum speed is KM/H.

Mile : The unit of trip mileage and total mileage is Mile. The unit of current speed, average speed, and maximum speed is MPH.

7.3 On/off password setting

Enter on/off password setting, press the up and down arrows to OFF/ON item, Briefly press M to select OFF/ON, to turn on or turn off the password on/off function; Choose ON to turn on the on/off password function and to switch password selection from left to right requires a brief press of the up and down arrows in either preferred direction to adjust the password character .



7.4 Wheel diameter information

In wheel information interface, 26 inches means the current display is set for a bike with a 26-inch wheel diameter. Return to the setting interface by a brief press of the M button.

Wheel diameter value can be set to 16", 18", 20", 22", 24", 26", 700c, 28" and 29".

The interface is shown as below

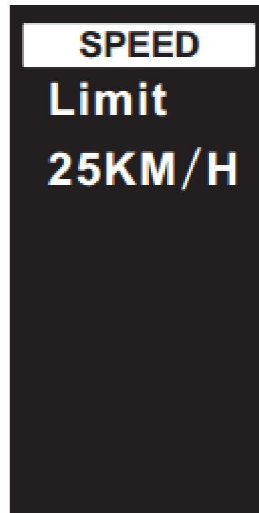


7.5 Speed limitation information

Speed limitation information indicates the maximum speed allowed in the current system (only show the changes through the serial port)

Default allowed maximum speed: 25KM/H

Interface shown as below:



7.6 Battery information

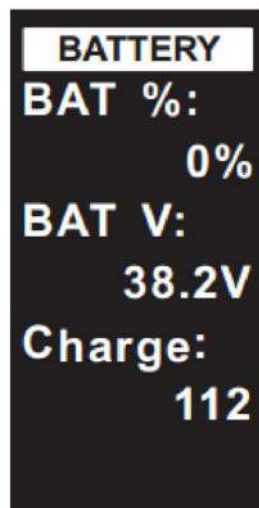
Return to setting interface in the battery information screen by a brief press of the M button.

BAT %: battery power;

BAT V: battery voltage;

Charge: numbers of charge cycles.

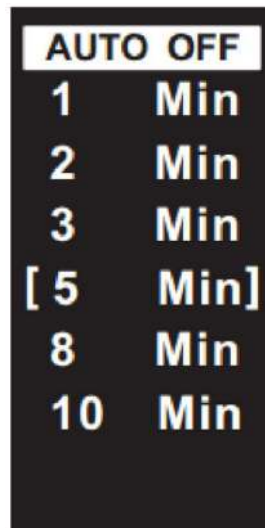
Interface shown as below:



7.7 Automatic shutdown time

Press the up and down arrow to choose the automatic shutdown time, the default setting is 5 mins, in auto Off interface. Press M to save and return to the setting interface.

Interface shown below



7.8 System information

Press to return to setting screen in system information interface.

S/N: device ID

FW Ver: Firmware version number;

HW Ver: Hardware version number;

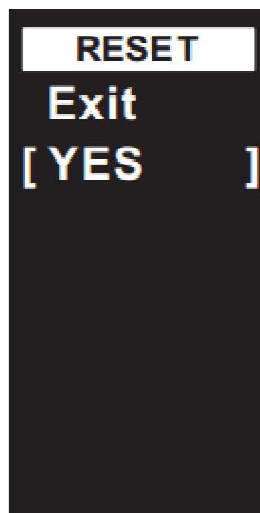
Interface shown as below:



7.9 Reset

Reset, press the up and down arrow to choose setting, switch to YES option, a Brief press on the M button to restart the display.

The parameters will reset to the factory state. Press Exit to exit the page and return to previous level. Interface below:

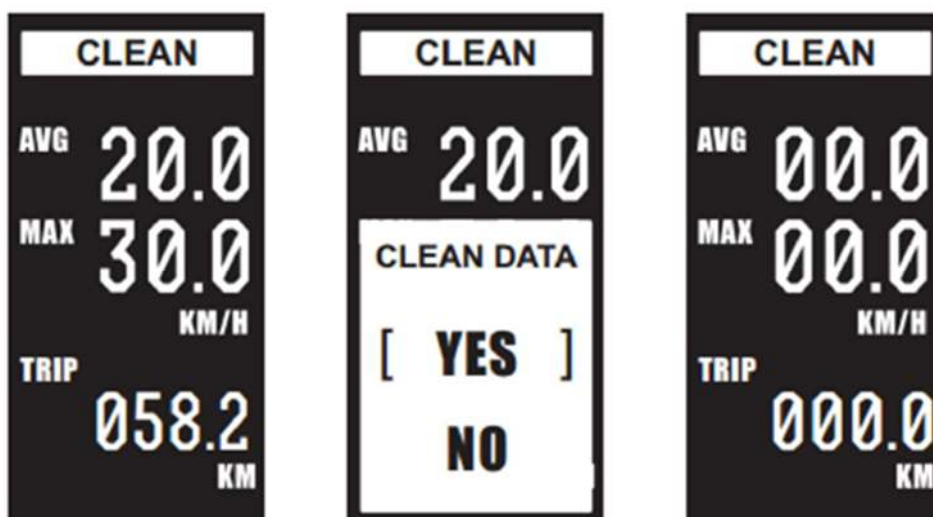


8 Data

10 display turned on, \rightarrow , enter the data clearance interface, short press the \rightarrow to choose item, short press again

to clearance trip mileage (TRIP), riding time (TRIP TIME), average speed (AVG) and maximum speed (MAX) and return to operation interface. Display will return to riding interface without data clearance if no operation in 5 seconds.

Normal shutdown and power-down will not make the above data clear.



9 Error information

The display can alert the bike failure, if failure detected, the display interface will show the error code. Interface shown as below:

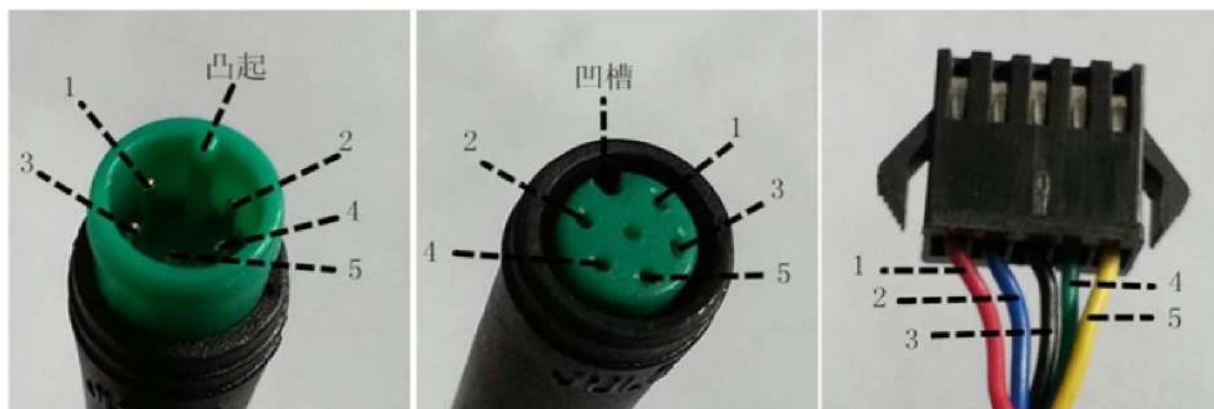


Error code definition

Error code table:

| Error code | Fault description | Checking method |
|---------------------|------------------------------------------------|-----------------------------------------------|
| "04" shown at speed | throttle doesn't turn back to zero position | Check if the throttle return to zero position |
| "05" shown at speed | throttle failure | check throttle |
| "07" shown at speed | overvoltage protection | Check the voltage of the battery |
| "08" shown at speed | failure of motor's hall signal wire | Check motor |
| "09" shown at speed | failure of motor's phase wire | Check motor |
| "11" shown at speed | failure of the controller's temperature sensor | Check controller |
| "12" shown at speed | failure of the current sensor | Check controller |
| "13" shown at speed | failure of the temperature of the battery | Check battery |
| "14" shown at speed | failure of the temperature of the motor | Check motor |
| "21" shown at speed | failure of the speed sensor | check the position of the speed sensor |
| "22" shown at speed | failure of the BMS communication | Check battery |
| "30" shown at speed | communication failure | check the connector of the controller |

10 Wire definition



Wires out of the display

wires connect to the display

connector to controller

Table 1 wires definition

| No. | Color | Function |
|-----|-------------|--------------------------------------|
| 1 | Red(VCC) | VCC |
| 2 | Blue(Kp) | Power control wire of the controller |
| 3 | Black (GND) | GND of display |
| 4 | Green(RX) | Data receive of the display |
| 5 | Yellow(TX) | Data transmit of the display |

C. Note

- Pay attention to the security, do not plug the display in and out the when the power is on
- Try to avoid exposure to harsh environments like heavy rain, heavy snow and strong sunlight
- When the display can't be used normally it should be sent for repair as soon as possible