

# L02 Smart Display Instrument Manual



## Version history

version	Reviser	Date of revision	Modifications	remark
V1.0	zhangqi	2024.04.30	first edition	
V1.1	MO, HAOQI	2024.05.07	Added factory reset menu description; Added Bluetooth lock unlock function description; Added version number naming convention description;	

**Note: 1. Due to the upgrade of the company's products, the display content of the product you get may be different from that in the manual, but it will not affect your normal use.**

**2. Do not plug and unplug with electricity, plugging and unplugging with live power may damage the electronic control accessories.**

§ 15.19 Labeling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

§ 15.21 Changes or modification warning.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

OR/The SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. Device has also been tested against this SAR limit.

§ 15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide

reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

RF warning for Portable device:

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

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# One. Product Introduction

## 1. Name

Smart display meters.

## 2. Product model

L02

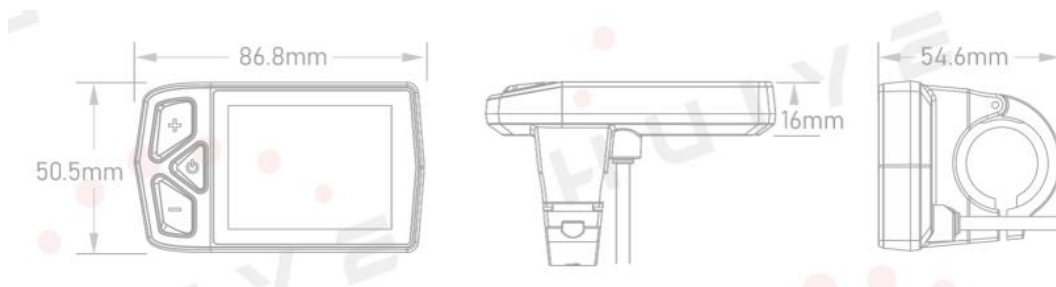
## 3. Product appearance



## 4. Product Specifications:

General parameters		
size	Length*width*height	86.8*50.5*16 (mm)
	Screen size	2.4''
	Fit the handlebar	22.2/25.4(mm)
screen	type	Light-emitting diodes
	color	Red/Yellow/Green/White
connector	type	M5 waterproof connector

	length	22cm
Core data	Operating voltage	12V-60V
	Operating temperature	-20°C- +70°C
	Waterproof rating	IP67
	Total weight	undetermined
	agreement	UART/CAN
Other features	Bluetooth	5.2+BLE (optional) 2402-2480MHZ
	oscillator	26Mhz
authentication	ROHS/CE/FCC/ISO13849	Support customization



## 5. Button Definitions

The L02 gauge has 3 buttons. Includes Power  key, plus key +, minus key -.

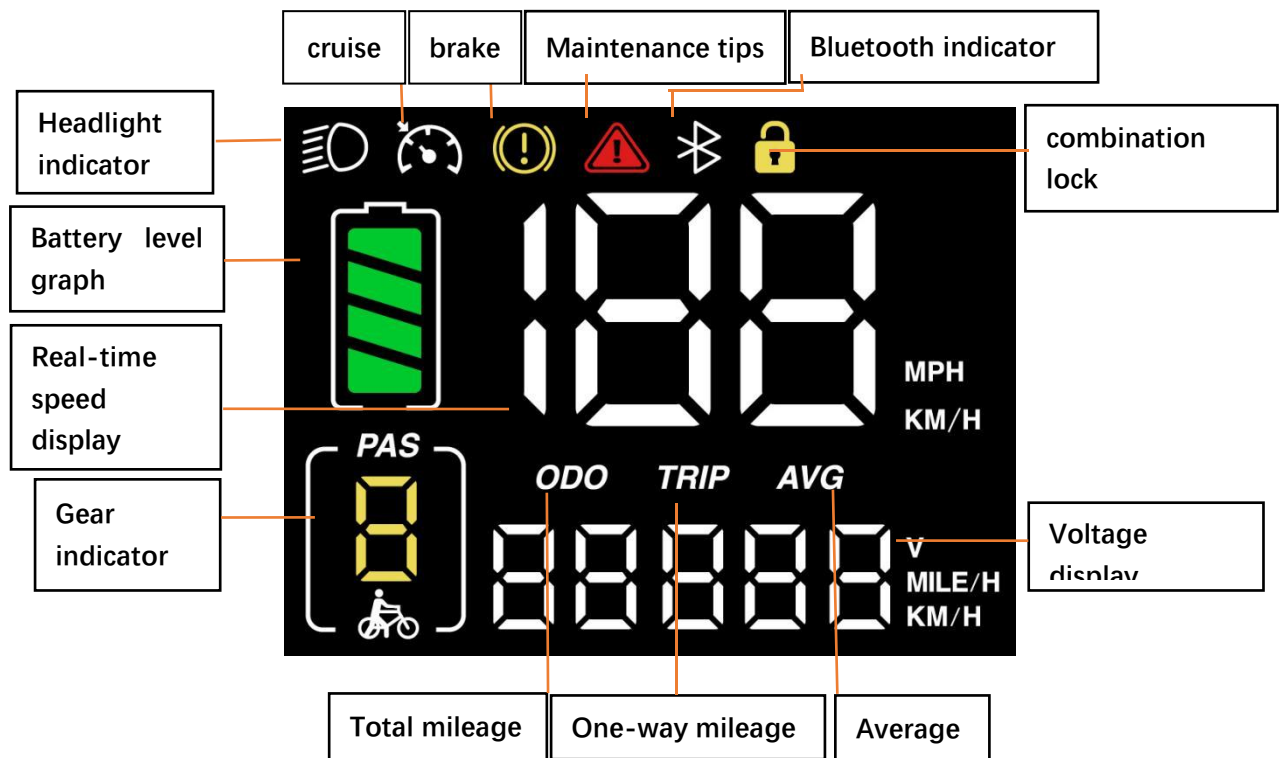
As shown in the figure below:



After long press the "power on and off button $\phi$ ", the instrument will work on the power on, and in the power on state, long press the "power on and off button $\phi$ " to power off the system.

The "+" and "-" keys are used to switch menus in the settings, and the main interface is short pressed to switch gears; Long press "+" on the main interface to switch on and off the headlights, and long press "-" to enter the boost mode; To enter the settings mode, double-click the power  $\phi$  key.

## 2. Description of the main interface



① Headlight Indicator: The headlight indicator graphic will illuminate when the headlight is turned on

② Cruising: When you enter a cruise, the icon will light up

③ Brake icon: When you pinch the brake, the icon will light up

④ Maintenance tip: Electronic systems have some ability to self-diagnose and report limited faults. The failure will be reported as an error code displayed on the screen.

⑤ Bluetooth indicator: After the APP is successfully connected to the instrument, the symbol will light up.

⑥ Battery Level Graph: The battery level graph is a graphical representation of the amount of power remaining in the battery. Once the battery is charged, more bars will appear in the graph. When the battery is depleted, fewer bars appear.

⑦ Real-time speed: Displays the current speed at which the e-bike is



traveling

- ⑧ Voltage Display: Displays the current voltage of the e-bike
- ⑨ Gear Indicator: Displays the current power assist gear of the e-bike
- ⑩ One-way mileage: The number of miles for a single trip
- ⑪ Total Mileage: The total number of miles traveled by the vehicle
- ⑫ Password lock: The instrument password function is turned on (password default 2020), the password is prompted to enter after restarting the instrument, and the password lock icon will light up
- ⑬ Average speed: The average speed at which the vehicle is traveling

## 1. Headlight switch

Turn on the light: Press and hold the "+" button when the light is off, the headlight logo on the screen will brighten, and the controller will be notified to turn on the light.

Turn off the lights: Press and hold the "+" button when the lights are on, the screen headlight logo will not disappear, but will be dimmed, and the controller will be notified to turn off the lights at the same time. As shown below:



## 2. Boost mode



Press and hold the "-" button when the car body is stationary, and the dynamic booster logo will be displayed, indicating that it will enter the booster, release the "-" button, and exit the booster mode. In booster mode, the booster logo is displayed dynamically, and the vehicle speed is less than 6km/h, and the booster state stops when the button "-" is

released. As shown below:



### 3. The main interface display is switched

When you boot on, the main interface will display ODO by default, and click the power button to display ODO-TRIP-AVG-voltage (V) in turn. As shown below:



### 4. Power display

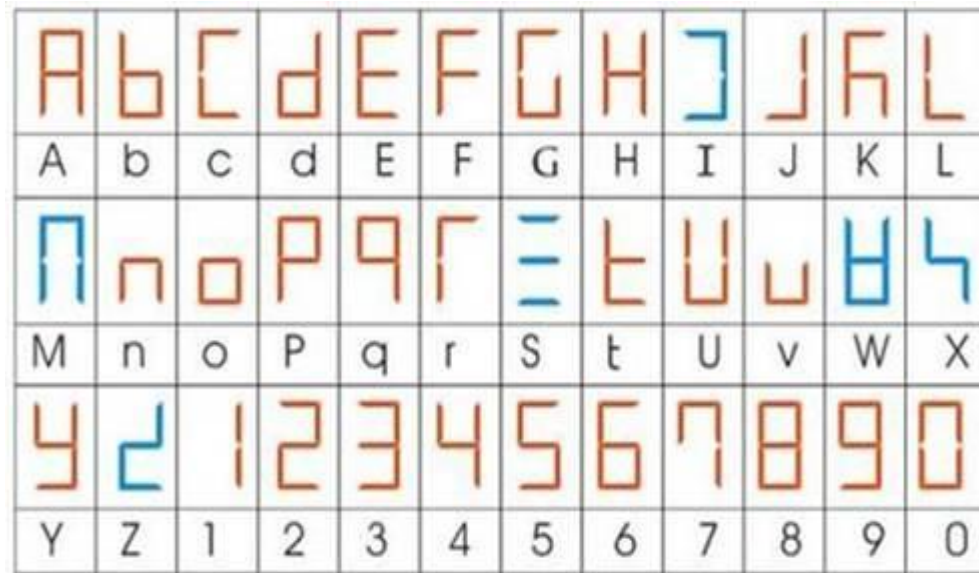
The battery level is displayed in four segments, when the battery is fully charged, the five-bar light is on, and the battery flashes when the battery is under-voltage, indicating that it needs to be charged immediately. As shown below:





### 3. Settings menu

#### 1. Character Comparison Table



UART Menu Description	BAFANG	Li-ion NO.2	KM5S
P1	unit	unit	unit
P2	gears	voltage	voltage
P3	Wheel diameter	Zero start	gears
P4	speed limit	Wheel diameter	Wheel diameter
P5	Power on password	speed limit	Motor magnets
P6	Automatic shutdown time	Power on password	speed limit
P7	cruise	Automatic shutdown time	Power on password
P8	The total mileage is reset to zero	Electric brake strength	Automatic shutdown time
P9		Drive mode	cruise
PA		Boost the starting intensity	The total mileage is reset to zero
Pb		cruise	
Pc		The total mileage is reset to zero	
bt	Bluetooth unlocking	Bluetooth unlocking	Bluetooth unlocking

this	Bluetooth unlock distance rating	Bluetooth unlock distance rating	Bluetooth unlock distance rating
for example	Bluetooth version number	Bluetooth version number	Bluetooth version number
dF	Factory reset	Factory reset	Factory reset
VR	Software version number	Software version number	Software version number

The following takes the lithium battery No. 2 protocol as an example to show the setting menu interface:





## 2. Setup Details

### Unit settings

Double-click the power button to enter the settings, "plus and minus buttons" to switch the selection unit menu, short press the power to enter the unit menu, you can switch 00, 01. 00 is metric and 01 is imperial. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

### Voltage setting

Double-click the power button to enter the setting, "plus or minus key" to switch to select the voltage setting menu, short press the power to enter the voltage menu, the setting options are 24V, 36V, 48V, 60V adjustable. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Zero-start setting

Double-click the power button to enter the settings, "plus and minus keys" to switch to select the zero start menu, short press the power to enter the zero start menu, you can choose Y or N (Y is to turn on zero start, N is to turn off zero start). Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Wheel diameter setting

Double-click the power button to enter the setting, "plus and minus button" to switch to select the wheel diameter menu, short press the power supply to enter the wheel diameter menu, the wheel diameter setting range is 8-30inch. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface. As shown in the figure below

## Speed limit settings

Double-press the power button to enter the setting, "plus or minus button" to switch to select the speed limit menu, short press the power to enter the speed limit menu, the speed limit setting range is 10-99. Short press the power button to select the settings and return to the

previous menu, and then double-click the power button to return to the main interface.

### Boot passcode settings

Double-click the power button to enter the settings, "plus and minus keys" to switch to select the boot password menu, short press the power to enter the boot password menu, and the setting options are Y (open password) or N (turn off password). Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

### Auto-shutdown settings

Double-click the power button to enter the settings, "plus and minus keys" switch to select the auto-shutdown menu, short press the power to enter the auto-shutdown menu, the setting options are 0-10, 30, 60 adjustable, when set to 0, it means that it will not automatically shut down. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

### E-ABS Strength Setting (Electric Brake)

Double-click the power button to enter the settings, "plus and minus



keys" to switch to select the E-ABS menu, short press the power to enter the E-ABS menu, and the setting options are ABS-N, ABS-L, ABS-S. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

### Drive mode settings

Double-press the power button to enter the settings, "plus or minus buttons" to switch to select the drive mode menu, short press the power to enter the drive mode menu, and the setting options are E-P, E, P. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

### Initiates the intensity setting

Double-press the power button to enter the setting, "plus or minus key" to switch to select the starting strength setting menu, short press the power to enter the starting strength setting menu, the setting options are 0-5. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Cruise menu

Double-click the power button to enter the settings, "plus and minus buttons" to switch to select the cruise menu, short press the power to enter the cruise menu, and the setting options are CM-Y/CM-N. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

The total mileage is reset to zero

Double-click the power button to enter the settings, "plus and minus buttons" to switch to select the total mileage clearance menu, short press the power to enter, Y represents the need to clear, N represents not clear, short press the power to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Motor magnets

Double-click the power button to enter the setting, "plus or minus key" to switch to select the motor magnet menu, short press the power to enter, the number of magnets can be selected in the range: 1~15 grains (or 1~63 grains, different protocol ranges are different) to adjust to the required value, short press the power to select the setting and

return to the previous menu, and then double-click the power button to return to the main interface.

#### Bluetooth lock switch menu

Double-click the power button to enter the settings, "plus and minus keys" to switch to select the Bluetooth lock switch menu, short press the power to enter the Bluetooth lock switch menu, and the setting options are BT-Y/BT-N. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

**Note: The Bluetooth lock unlock function needs to turn on the password function and turn on the Bluetooth lock**

#### Bluetooth distance level menu

Double-click the power button to enter the settings, "plus and minus buttons" to switch to select the Bluetooth distance level menu, short press the power to enter the Bluetooth distance level menu, and the options can be set from 1 to 5. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Bluetooth version number menu

Double-click the power button to enter the settings, "plus and minus keys" to switch to select the Bluetooth version number menu, short press the power to enter the Bluetooth version number menu, you can view the current Bluetooth version number. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Factory reset

Double-click the power button to enter the settings, "plus or minus key" to switch to select the factory reset menu, short press the power to enter the menu, the configurable options are Y/N, Y means factory reset (all parameters will be restored to the factory state), N means no factory reset. Short press the power to select Y and set, the meter will automatically restart and return to the main interface. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

## Meter version number menu

Double-click the power button to enter the setting, "plus or minus key" to switch to select the instrument version number menu, short press

the power to enter the instrument version number menu, you can view the current version number of the instrument. Short press the power button to select the settings and return to the previous menu, and then double-click the power button to return to the main interface.

Version naming rules: customer code + agreement + number. For example, the version number: A0L-04, the code A0 means Huiye; L represents the lithium battery agreement (in addition, 5 represents the 5S agreement, and B represents the Octagon agreement); 04 indicates version 04

## 4. Fault codes

BF Fault Code			
serial number	Status data	Error code	meaning
1	0X01	Not shown	Normal state
2	0X03	Not shown	Braked
3	0X04	Error 04	The signal level of the controller power-on detection turnbar is greater than the start-up level
4	0X05	Error 05	The knob signal is shorted to the knob GND, the knob signal is shorted to the knob +5V, and the knob GND is broken
5	0X06	Not shown	The battery voltage is lower than the controller's low-voltage protection threshold
6	0X07	Error 07	The battery voltage is higher than the controller's low-voltage protection threshold
7	0X08	Error 08	The motor Hall signal is abnormal
8	0X09	Error 09	The phase wire of the motor is short-circuited or open-circuited
9	0X10	Error 10	The temperature of the motor reaches the protection threshold
10	0X11	Error 11	The motor temperature sensor is abnormal
11	0X12	Error 12	The current sensor is abnormal
12	0X13	Not shown	The temperature sensor inside the battery is abnormal
13	0X14	Error 14	The controller temperature reaches the protection threshold

14	0X15	Error 15	The temperature sensor in the controller is faulty
15	0X21	Error 21	The internal & external speed sensor of the battery is abnormal
16	0X22	Not displayed (displayed when reading battery information --)	The controller is unable to receive the battery pack BMS data
17	0X23	Not shown	The headlights are abnormal
18	0X24	Not shown	The headlight sensor is abnormal
19	0X25	Error 25	The torque signal of the torque sensor is abnormal
20	0X26	Error 26	The torque sensor has an abnormal speed signal
21	0X30	Error 30	The meter does not receive controller data

Lithium battery No. 2 fault code			
serial number	Fault information	Error code	remark
1	Hall failure	8	
2	Handlebar failure	5	
3	Controller failure	16	Octagon Protocol does not have this failure (custom).
4	Undervoltage protection status	6	
5	The motor is out of phase	9	
6	Faulty brake handlebar	2	Octagon Protocol does not have this failure (custom).
7	The controller communication is faulty	29	Unable to receive data from the meter (Octagon Protocol does not have this fault).
8	Instrument communication failure	30	Unable to receive data from the controller

KM5S fault code			
serial number	Fault information	Error code	remark
1	Undervoltage protection status	6	
2	The current is abnormal	12	
3	Handlebar abnormality	5	
4	The motor is out of phase	9	
5	Motor Hall abnormality	8	
6	Abnormal braking	17	Octagon Protocol does not have this fault (custom)
7	Instrument communication failure	30	Unable to receive data from the controller