

ES20 User Manual

Version: 0.1

GENERAL INFORMATION

1.1 Product Specifications

Type	ES20	ECU	ES20 Meter
Standby Power	<4.5 mA	Working Voltage	12V
Dimension	95.4*48*48 (mm)	Working Temperature	-30°C~70°C
Head Lamps	ES20 Head Lamp	Acceleration	Hall Acceleration
Brake	Mechanical Brake	Hardware Version	V3.6
Case Material	None	Software Version	0x36

1.2 Harness Interface

Interface	Terminal Specification	
5 Core Communication Wire	Red, Green, Blue, Yellow, Black	Meter
NFC Coil	Red, Black, Green, Blue	
Lamp Wire	Red, Yellow, Black	

2. TECHNICAL PARAMETERS

2.1 BLE Parameters

No	Item	Parameters
1	Antenna	FPC
2	Chipset	BLUENRG-355MC
3	Frequency	2402~2480MHz
4	Sensitivity	Excellent Receiver Sensitivity -90dBm

NFC Parameters

No	Item	Parameters
1	Antenna	PCB
2	Chipset	MS523
3	Frequency	13.56MHz

2.2 Other Parameter

No	Item	Parameters
1	MCU	Core: HC32F460JEUA-QFN48TR Flash Memory: 512 kB Ram: 192kB
2	Timing Report	Reportstatus at pre-set intervals

3. METER FUNCTION DESCRIPTION

3.1 Operation Function

No	Function Item	Function Description
1	Headlight Control	The headlights are turned on by default when the power is turned on. The headlights are turned off when the power is turned off. The headlights are blinking when looking for the scooter, and the headlights are automatically turned off when charging.

2	Speed Limit	<p>The speed limit mode is sent by the APP via Bluetooth to the meter, and then the meter sets the controller.</p> <p>The speed is limited under 25 km/h.</p>
3	Acceleration	<p>When the power is on, the assist sliding speed exceeds 4 km/h (2.5 mph).</p> <p>When the handle is pressed, the system will control the rotation of the hub according to the depth of the handle press.</p> <p>The lighter the press, the slower the speed, the faster the press, the faster the speed. The real-time speed is displayed in the first three words of the meter.</p>
4	Brake	<p>The brake is electronic brake + drum brake. When the brake is pressed, the system controls the output electromagnetic brake and slows down gradually until the hub is locked.</p>
5	Kick Start	<p>The controller can drive the motor only when the speed of the kicking is above 4 km/h or 2.5mph.</p>
6	Speed Unit Switching	<p>The speed unit of kilometer or mile is controlled by app via Bluetooth.</p> <p>The speed unit can be changed by pressing the button 5 times.</p>
7	Online upgrade	<p>Controller firmware and instrument firmware can be upgraded through Bluetooth.</p>
8	Bluetooth control command receiving	<p>It can receive instructions sent by mobile phone/upper computer via Bluetooth, analyze them, and perform corresponding actions, such as turning on and off vehicle locks and headlights</p>
9	Issue of control instruction	<p>Relevant control instructions are sent through UART channel to control the relevant actions of the controller.</p>
10	Error Code Showing and reporting	<p>The meter can display error code reported by its own judgment and controller, and report to the upward computer/APP via Bluetooth timing.</p>
11	Timely reporting of real-time vehicle information	<p>The instrument reports the real-time status information of the body, such as current speed, VMT, total VMT, etc., through Bluetooth timing up-position machine/APP</p>
12	Vehicle configuration	<p>After receiving the instruction to read the vehicle configuration</p>

	information report	information via Bluetooth, the instrument will report the vehicle configuration information via Bluetooth upward machine/APP.
13	Switch to start mode	Switch the scooter to power-assisted or non-power-assisted startup mode through Bluetooth command configuration;
14	E level implementation mode	When the speed is greater than 3km, the motor can be started. The maximum speed is 5km. It can only be started with help, not without help, and the meter flashes at the same time.
15	On/off cruise mode	Configure the scooter to turn on or off the constant speed cruise mode by Bluetooth command.
16	P mode	Park the scooter through Bluetooth, NFC or mechanical key.

3.2 Error reporting Function

Error Code	Error Item	Reasons
01E	Over current protection	The current exceeds the limit.
02E	low-voltage protection	battery voltage lower than 43V
03E	Short circuit of motor phase line	Short circuit of motor phase line when unlocking
04E	Motor block protection	Motor blocked or short circuit or drive failure
05E	Drive upper bridge failure	Drive upper bridge MOS tube damaged or breakdown
06E	Drive down bridge failure	Drive down bridge MOS tube damaged or breakdown
07E	Hall problem for the motor	Hall line sequence is wrong or poorly connected
08E	High temperature of the motor	Motor temperature higher than normal working temperature
09E	Throttle problem	Hall problem for the throttle or poorly connected
10E	Left rake problem	Brake problem or poorly connected
11E	communication failure between instrument and electronic controller electronic controller	Instrument problem or poorly connector for the communication signal wire signal wire
12E	Instrument received data timeout failure	Instrument problem or poorly connector for the communication wire
13E	Battery Communication Failure	Poor contact of the battery communication wire or defective device
15E	Controller firmware missing	Instrument and controller communication failed or unable to communicate
16E	Battery protection board is missing	Battery program upgrade failed
17E	Instrument firmware is missing	Instrument program upgrade failed
18E	Turn and turn back	Do not turn back on startup
19E	Left brake handle not in position	The left brake handle is not in position on boot

3.3 Display Function

NFC key card: In the off state, the NFC key card is close to the screen to turn on and unlock; in the power on state, the NFC key card is close to the screen, shut down and lock the scooter.

Function button: Short press the function button to turn on the product, and press it for about 3s to turn it off.

Press the function button to turn on/off the headlight when power-on.

Press twice to switch to E (pedestrian mode) /L (economy mode) /H (sports mode) when power-on.

E mode is pedestrian mode, with a maximum speed of 5km/h, which is suitable for use on pavement.

L mode is economy mode, with a maximum speed of 15km/h;

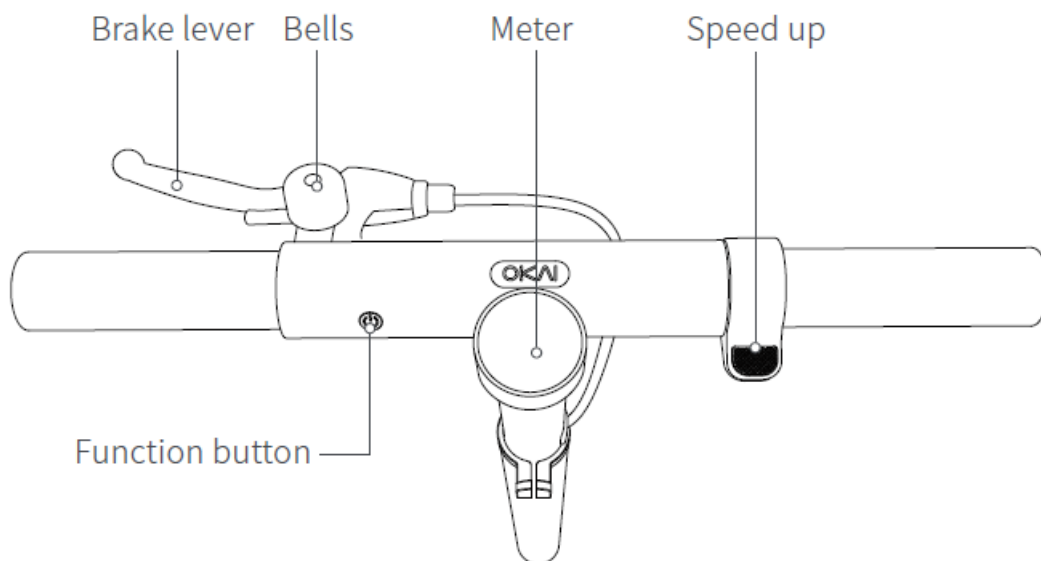
H mode is sports mode, with a maximum speed of 25km/h;

Press five times in riding mode to switch the speed unit;

APP turns on the cruise function, which maintains a constant speed. When the vehicle speed is greater than 5km/h, press and hold the function button for 2 seconds to enter cruise mode at constant speed.

Brake handle: Squeeze the brake handle which will control both the disc brake and the electromagnetic brake.

Press the throttle to accelerate the scooter.



FCC Statement:

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

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

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.
- Consult the dealer or an experienced radio/TV technician for help.