

Jinhua Weili Technology Co., Ltd.

Product Specification

Customer Name: Zhejiang Okai Vehicles Co., Ltd.

Product Name: Instrument

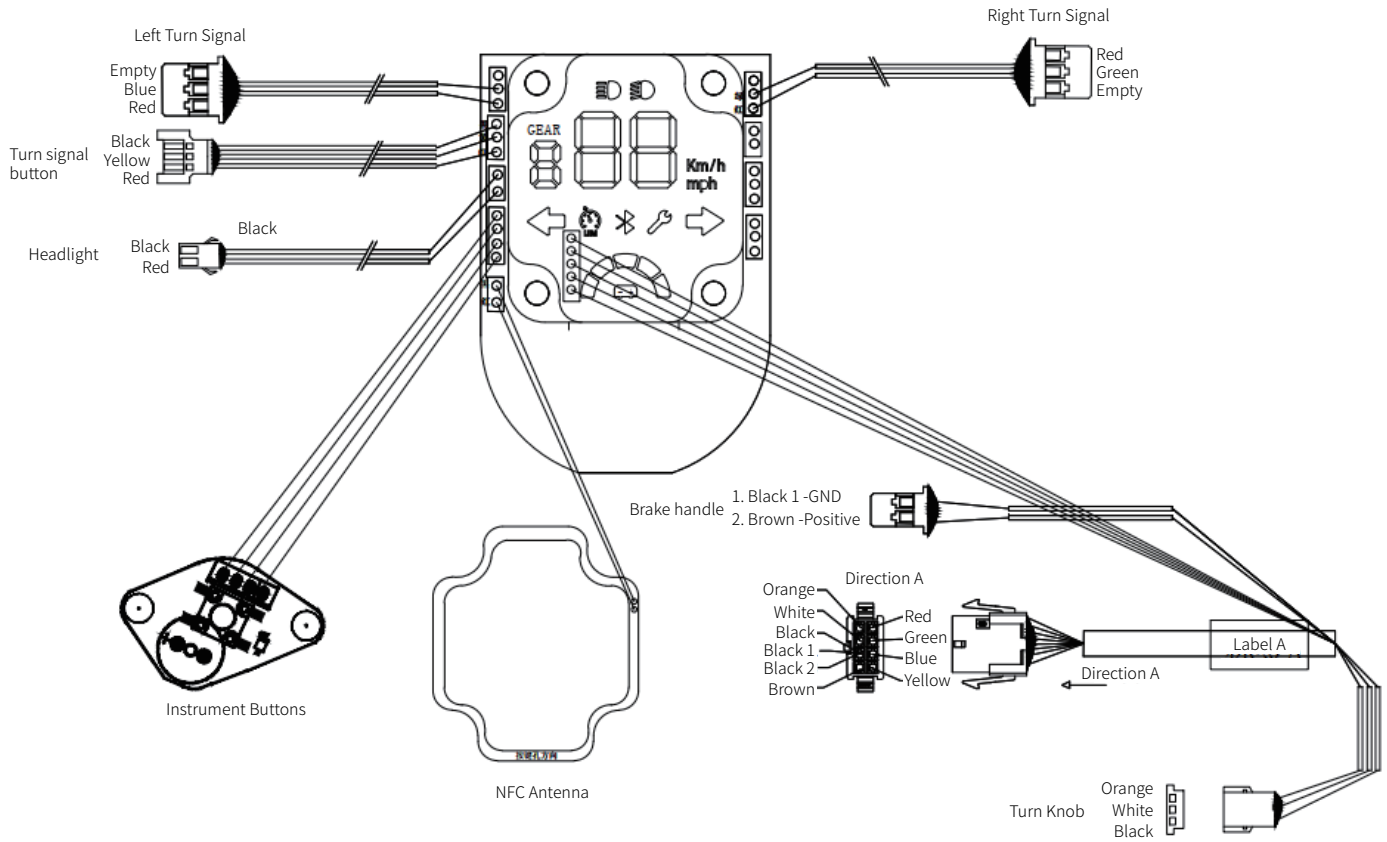
Product Model: HY_LEB_IG

Production Date: 2024/12/12

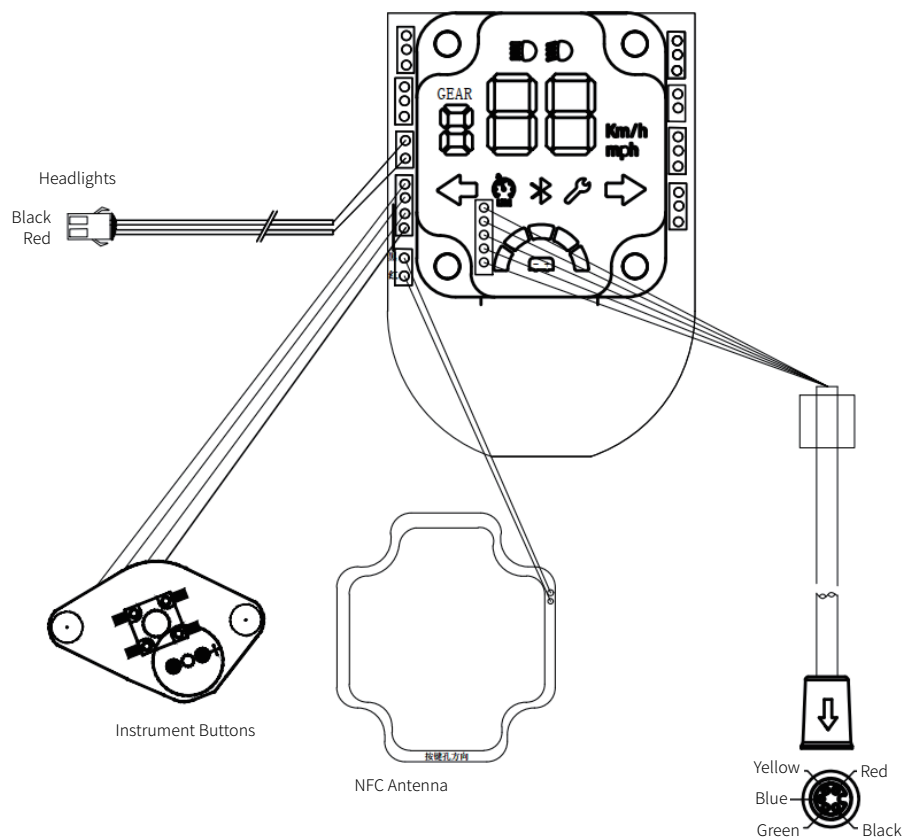
Customer Acknowledgment Seal		Jinhua Weili	
Approved by	Audited by	Sales	Quality

I. Diagrams

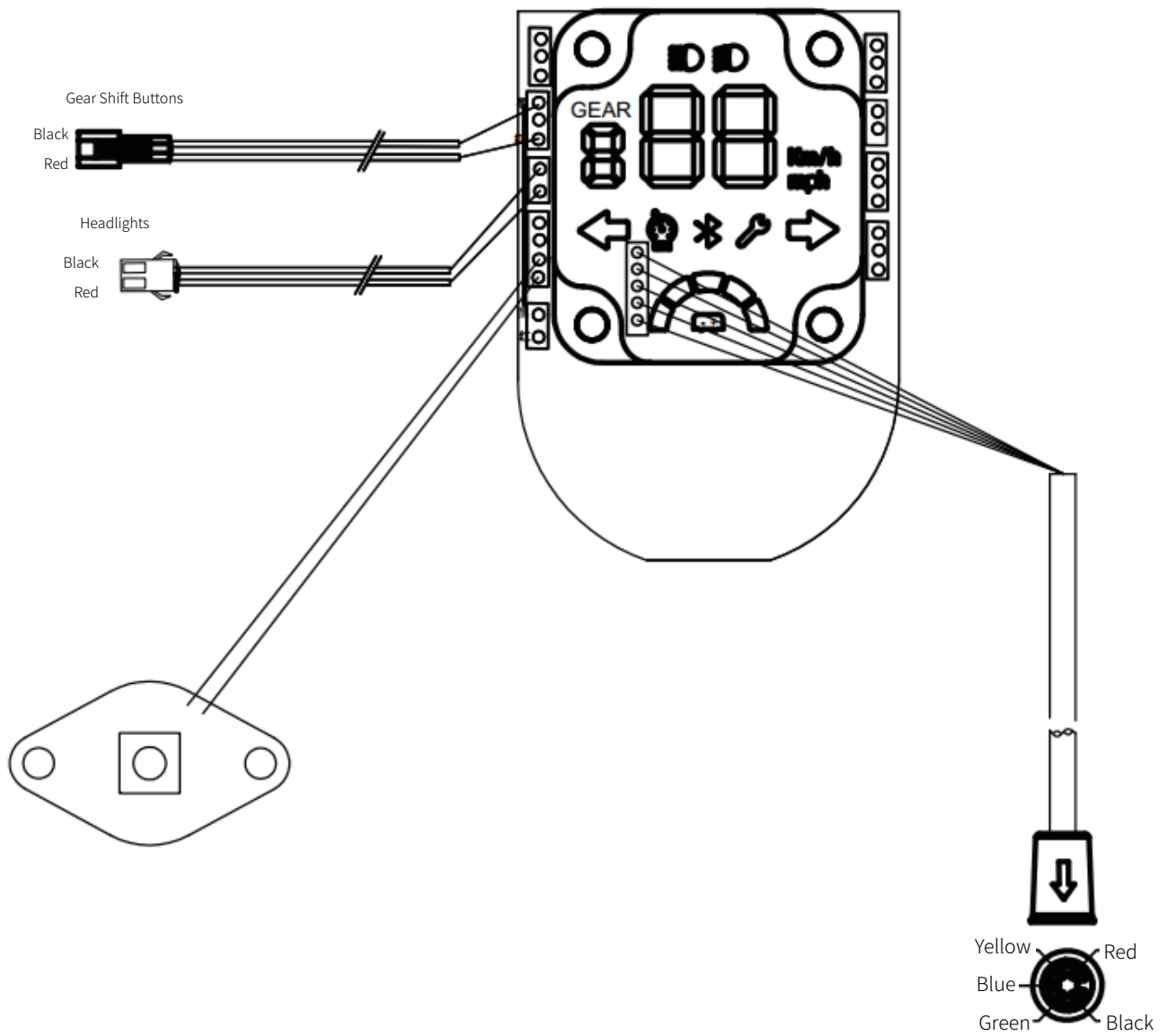
1.1 Jianshan Road, Wucheng District, Jinhua City



1.2 EA20 Instrument Wiring Diagram

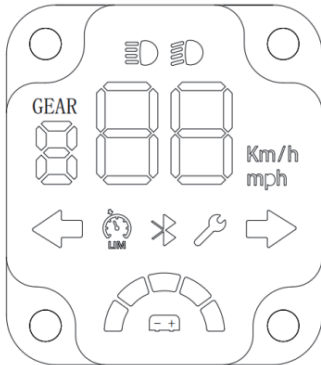


1.3 EBF20 Instrument Wiring Diagram



II. Display Definitions

2.1 Digital Tube Display Diagram

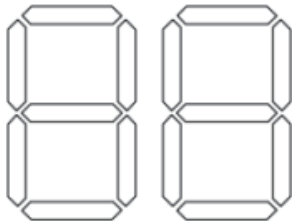


2.2 Battery Level Display



2.3 Speed Display Area

Display according to the function: speed, faults, UP (upgrade), LC (lock), FU (fully charged), charging percentage, fault codes, etc.



2.4 Left and Right Turn Signal Indicators



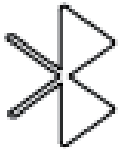
2.5 Unit Switch Between Miles and Kilometers

Km/h
mph

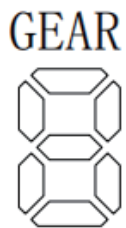
2.6 Cruise Control Symbol



2.7 Bluetooth Symbol



2.8 Gear Indicator Area



2.9 Wrench Symbol

The wrench symbol lights up and, along with the speed display, indicates a fault code.



2.10 Headlight Symbol



III. Function Descriptions

1. Power On/Off Function

After the instrument is completely powered off and powered on for the first time, the instrument must be awakened by pressing the button.

Once awakened, press the button for 1 second to turn it on and send the power-on command to the controller.

NFC can be used for power on/off via the app or NFC.

2) App Function

After the app is connected and bound, it can issue commands for NFC card binding, locking, etc.

(Some products may not be equipped with this feature.)

3) Activation Function

The vehicle needs to be activated via the designated app to remove the speed limit for the gears.

4) Parking Mode

When the vehicle starts with zero speed, it enters parking mode, and the instrument shows "P." There is no parking mode in non-zero start mode, and the app defaults to zero start. (Some products may not be equipped with this feature.)

5) NFC function

Binding via the app allows for power on/off. (Some products may not be equipped with this feature.)

6) Button Function

The button can control power on/off, headlight on/off, gear shift, atmosphere light control, and speed unit switching.

7) Tail Light Function

The tail light status is controlled based on the host command.

8) Ambient Light Function

The ambient light can be controlled via a four-press of the button or the app. It turns off when powered off.

9) Charging Display

The instrument displays the charging interface, showing the battery percentage.

The battery bar runs in a marquee style while charging.

10) Cruise Control Function

(Some products may not be equipped with this feature.)

11) Instrument Screen Display

Displays speed, speed unit, gear, battery level bar, Bluetooth, headlights, cruise control, and fault indicators.

12) Low Battery Warning

A low battery buzzer alarm sounds when battery level is low.

13) Buzzer Function

The buzzer provides alert signals (some products may not be equipped with this feature).

14) Gear Display

The gear position area displays E, L, and H for E mode, L mode, and H mode.

The gear position area displays 0, 1, and 2, depending on the vehicle configuration.

15) OTA Function

1. The instrument can be upgraded over the air.
2. The controller can be upgraded via the instrument.

16) Fault Code Viewing

When a fault occurs, the instrument will display the corresponding fault code based on the communication protocol.

OK Instrument General Fault Codes

01E Overcurrent protection

02E Under-voltage protection, battery below 5% or voltage below 37V

03E Motor phase line fault

04E Motor stall

05E Upper MOSFET failure

06E Lower MOSFET failure

07E Motor Hall sensor fault
 08E Motor temperature too high, 100 limits current, 130 error
 09E Throttle fault
 11E Controller offline
 12E Instrument offline
 13E Battery communication fault
 14E Brake lever fault
 15E Controller firmware lost
 17E Instrument firmware lost
 18E Throttle not in neutral position
 19E Brake lever not in neutral position
 31E Controller temperature too high, 85 limits current, 95 error

When a fault occurs, the red fault indicator lights up, the digital tube displays the corresponding fault code, and the buzzer sounds three times before stopping. After restarting, the fault will be reset. If multiple faults occur simultaneously, the highest priority fault code will be displayed.

17) Version Definition

The app vehicle control tool can query the software and hardware versions for each vehicle model.

Model	Hardware Version	Software Version
EA20	C0	Initial Version (Hexadecimal): European version 81, US version 01 Adjust encoding based on needs
ES53	C2	Initial Version (Hexadecimal): European version 81, US version 01 Adjust encoding based on needs
EBF20	C4	Initial Version (Hexadecimal): European version 81, US version 01 Adjust encoding based on needs

IV. Electrical Performance Specifications

1.1 Instrument Basic Parameters

Parameter Name	Parameter Value	Remarks
Rated Voltage	36V~48V	ES53:36V EA20:48V EBF20:36V
Maximum Voltage	90V	

1.2 Power Consumption Requirements

When the instrument is powered on and the functions are activated, the instrument can be powered on/off via buttons, the app, or NFC.

When the instrument receives a shutdown command and enters a low-power sleep mode, the shutdown current under nominal input voltage is less than 3mA.

1.3 Bluetooth Function

The instrument communicates with the app via Bluetooth, with a connection range depending on the environment and configuration. In an unobstructed and interference-free environment, the Bluetooth range can reach up to 10 meters, with the exact distance depending on the product's performance.

V. Usage Precautions

- 1) The specification may be updated according to customer requirements without prior notice.
- 2) The wiring harness for the communication cable must be connected according to the definitions. Incorrect connections, such as reverse polarity, can cause irreversible damage to the product.
- 3) Do not use this instrument with an unmatched controller, as it will not function properly.
- 4) Do not disassemble the product. If the product has performance issues, return it to our after-sales service for repair.
- 5) The provided product should only be used under the conditions specified in the specification. We do not guarantee product quality if the application exceeds the specified limits.
- 6) Do not short-circuit the output (lights), as it will damage the instrument.
- 7) Do not dispose of the product casually.

For instruments that cannot be repaired after damage, they should be properly recycled.

- 8) Do not operate in environments with strong static electricity:

When operating, using, or installing this instrument, please take precautions against static electricity. Do not use the instrument in areas prone to static buildup, as high-voltage static can damage the instrument and cause it to malfunction.

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.

VI. RF Expouse Warning

- The device has been evaluated to meet general RF exposure requirement.
- The device can be used in portable exposure condition without restriction.
- Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- 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:
 1. Reorient or relocate the receiving antenna.
 2. Increase the separation between the equipment and receiver.
 3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 4. Consult the dealer or an experienced radio/TV technician for help.