KEY-DISP

The eBike Display
Users Manual

KD21C

Content

Product name and model

Intelligent LCD display of eBike; model: KD21C.

Specifications

- ●24V/36V/48V Power Supply
- ●Rated working current: 10mA
- ●The maximum working current: 30mA
- ●Off leakage current: <1uA
- ●The supply controller working current: 50mA
- ●Working temperature:-20℃~ 60℃
- ●Storage temperature: -30℃~ 70℃

Appearance and Size

Display appearance and dimension figure (unit: mm)
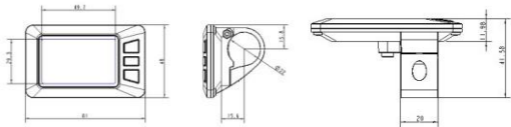
◆**Color categories**

Top shell of the display is two color options, black and white, and bottom shell of the display is only one black.

Function Summary and Button Definition

◆**Function Summary**

KD21C can provide a lot of functions to fit the users' needs. The

indicating contents are as following

- ●Smart Battery indicator
- ●Motor-output indication
- ●Assistance-level indication
- ●Speed indication (incl. running speed, max speed and average speed)
- ●Trip distance and total distance
- ●The push-assistance function
- ●Trip time display of single
- ●The Lighting On/Off
- ●Error Code indication
- ●Various Parameters Settings (e.g. wheel size, speed-limited, battery level bar, assistance level, controller limited current, max speed, password enable, etc.)
- ●Recover Default Settings

◆**Functional Area Distribution**

Functional Area Distribution
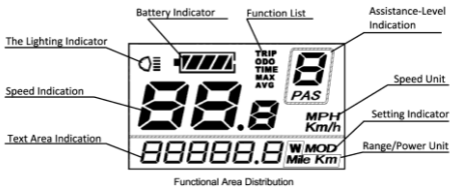
◆**Button Definition**

There are three buttons (M, +, −) on the KD21C display that represented by the following functions respectively: **MODE, UP, DOWN**.

General Operation

◆**Switching the eBike System On/Off**

To switch on the eBike system, hold the **MODE** button for 2s.

In the same way to hold the **MODE** button for 2s again, the eBike system will be switched off.

When switching off the eBike system the leakage current is less than 1 uA.

■**When parking the eBike for more than 10 minutes, the eBike system switches off automatically.**

◆**Display Interface**

After switching on the eBike system, the display shows Running Speed and Total Distance except battery indicator and assistance level.

To change the indicated information, press the **MODE** button to show in turn as below: Running Speed (Km/h) → Trip Distance (Km) →Trip Time (Hour.) → Max Speed (Km/h) → Average Speed (Km/h) → Motor Power (W) → Running Speed (Km/h).
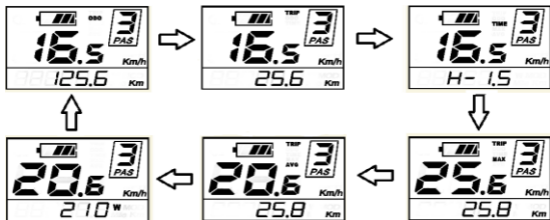
◆**Switching Push-assistance mode On/Off**

To access the push-assistance mode, hold the **DOWN** button always, the eBike will go on at a uniform speed of 6 Km/h, "P" is showed on the screen at the same time. The push-assistance function switches off as soon as you release the **DOWN** button.

Push-assistance Mode

■**Push-assistance function may only be used when pushing the eBike. Danger of injury when the wheels of the eBike do not have ground contact while using the push-assistance function.**

◆**Switching the Lighting On/Off**

To switch on the display backlight and headlight of the eBike, hold the **UP** button for 2s.

In the same way to hold the **UP** button for 2s again, the backlight and the headlight will be switched off.

Switch On/Off the Lighting

◆**Assistance Level Selection**

Assistance levels indicate the output power of the motor. The default value is level "1".

The default power ranges from level "0" to level "5".The output power is zero on Level "0". Level "1" is the minimum power. Level "5" is the maximum power. Gear to level "5" and then press the **UP** button, the interface shows "5" still and "5" flashing prompts top. Gear to level "0" and then press the **DOWN** button, the interface shows "0" still and "0" flashing prompts low.

To change assistance level, press the **UP**/**DOWN** to increase or decrease until the desired assistance level is displayed.

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Assistance Level "3"

◆**Battery Indicator**

The five battery bars represent the capacity of the battery. When the battery is in low voltage, battery frame will flash to notice that the battery needs to be recharged immediately.

Low Voltage Flash
Battery Indicator

◆**Error Code Indication**

If there are errors about the electronic control system, the error code will appear automatically. Here is the message of the error code in **Attached list 1**.

Error Code Indication

■**Offer the display to a Service Center when an error code appears.**

General Settings

After the eBike system is switched on, to access general settings

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menu, hold both the **UP** and **DOWN** button for 2s.

■**All the Settings are operated in the case of parking the eBike.**

◆**Trip Distance Clearance**

TC represents trip distance clearance setting.

To clear trip distance, press the **UP/DOWN** button to choose Y or N. The default value is N.

To store a changed setting, press the **MODE** button and then access backlight contrast settings.

Various symbol definitions refer to **Attached list 4.**

Trip Distance Clearance Settings Interface

◆**Backlight Contrast settings**

bL represents backlight contrast settings. Level "1" is the low brightness. Level "2" is the middle brightness. Level "3" is high brightness. The default value is "1".

To modify the backlight brightness, press the **UP/DOWN** button to increase or decrease until the desired setting is displayed.

To store a changed setting, press the **MODE** button and then access unit Conversion Settings.
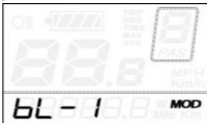
Backlight Brightness Settings Interface

◆**Unit km/mi Conversion**

U represents unit settings, "1" is mile, "2" is kilometer. The default

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value is "2".

To convert unit, press the **UP/DOWN** button to increase or decrease until the desired setting is displayed.

To store a changed setting, press the **MODE** button, and then access trip distance clearance settings.

To store a changed setting, hold the **MODE** button for 2s and then exit general settings.

Mile and Kilometer Conversion Settings Interface

General Parameter Settings

To access general parameter Settings interface, hold both the **UP** and the **DOWN** button for 2s, then hold both the **DOWN** and **MODE** button for 2s again.

◆Wheel Diameter Settings

Ld represents wheel diameter settings. Electable values are 16, 18, 20, 22, 24, 26, 700C and 28. The default value is 20 inch.

To change basic settings, press the **UP**/**DOWN** button to increase or decrease until the desired value is displayed.

To store a changed setting and access speed-limit settings interface, press the **MODE** button.

Wheel Diameter Settings Interface

◆Speed-limit Settings

LS represents the limit speed settings. When the running speed is

faster than limit speed, the eBike system will switch off automatically. Limit speed ranges from 12Km/h to 40Km/h. The default value is 25Km/h.

To change basic settings, press the **UP**/**DOWN** button to increase or decrease until the desired value is displayed.

To store a changed setting and exit General Parameter Settings, hold the **MODE** button for 2s.

Limit Speed Settings Interface

Personalized Parameter Settings

Personalized Parameter Settings can match a variety of requirements in use. There are 8 Settings items, such as Battery Power Bar Settings, Power assistant level Settings, Over-current Cut Settings, Power Assistant Sensor Settings, Speed Sensor Settings, Throttle Function Settings, System Settings and Power-on Password Settings. Please refer to the **Attached list 2**.

To access Personalized Parameter Settings items option page, hold both the **UP** and **DOWN** button for 2s, then hold both the **UP** and **DOWN** button again.

To access the corresponding settings page, press the **UP/DOWN** button to increase or decrease until the desired item is displayed, and press the **MODE** button again.
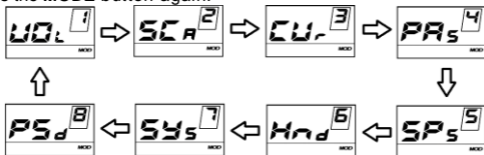
Options Selection Interface

◆**Battery Power Bar Settings**

VOL represents voltage settings. Each bar represents a voltage value. 5 bars voltage values must be entered one by one. For example, VOL 1 is first bar voltage value, the default value is 31.5.

To set battery power bar, press the **UP**/**DOWN** button to increase or decrease the number.

To store a changed setting and access the second bar, press the **MODE** button.

By analogy, after 5 bars voltage values is entered, hold the **MODE** button to confirm and return to the previous menu.

Battery Power Bar Settings

◆**Assistance Level Settings**

Assistance Level option

In assistance level settings, there are 8 modes to select: 0-3, 1-3, 0-5, 1-5, 0-7, 1-7, 0-9, 1-9. The default value is 0-5.

To select the mode of assistance level, press the **UP/DOWN** button to increase or decrease until the desired setting is displayed.

To store the changed setting and access the PAS ratio settings page, press the **MODE** button.

1-5 flash
PAS Mode Option Interface

PAS Ratio Settings

To modify the value of PAS ratio can match the different requirements.

For example, the range is "45-55 percent" of "1" level, bottom value can be modified, and the default value is 50 percent.

To store the modified setting, press the **MODE** button and turn to the next PAS ratio settings.

After all PAS ratio inputted, hold the **MODE** button for 2s to confirm and then return to previous menu.

Please refer to **Attached list 3**.

PAS Ratio Interface

◆Controller Over-Current Cut Settings

CUR represents controller over-current cut settings. CUR value can be changed from 7.0A to 22.0A. The default value is 15A.

To change basic settings, press the **UP/DOWN** button to increase or decrease the value of the current.

To store a changed setting, hold the **MODE** button and then return to previous menu.
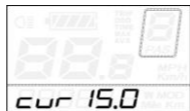
CUR Settings Interface

◆Power Assistant Sensor Settings
The Direction of Power Assistant Sensor Settings

PAS represents power assistant sensor settings. "run-F" means forward direction, while "run-b" means back direction. The default value is "run-F".

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To change The Direction of Power Assistant Sensor Settings, press the **UP/DOWN** button to select F or b.

To store a changed setting, press the **MODE** button and then access settings mode of PAS sensitivity.

Direction of PAS Sensor Settings

The Sensitivity of PAS Settings

SCN represents the sensitivity of PAS settings. The sensitivity value ranges from "2" to "9". "2" is the strongest, "9" is the weakest. The default value is "2".

To change the sensitivity of PAS settings, press the **UP/DOWN** button to select sensitivity value.

To store a changed setting, press the **MODE** button and then access magnet disk settings mode.

The Sensitivity of PAS Settings

Magnet quantity Settings

N represents magnet numbers of PAS disk. The default value is 6.

To change magnet numbers of PAS disk, press the **UP/DOWN** button to select quantity corresponding to PAS disk.

To store a changed setting, hold the **MODE** button and then return to previous menu.

PAS Magnet Disk Settings

◆**Speed Sensor option**

SPS represents speed sensor settings. The default value is 1

To change speed sensor settings, press the **UP**/**DOWN** button to select the quantity of magnet head (the range is from 1 to 9).

To store a changed setting, hold the **MODE** button and then return to previous menu.

Speed Sensor Selection

◆**Throttle Definition**

Throttle Push-assistance Enable/Disable

HL represents throttle push-assistance function. HL-N represents throttle assistance push function is disabled. HL-y represents throttle assistance push function is enabled. The default value is N.

To change throttle push-assistance function, press the **UP/DOWN** button to select Y.

To store a changed setting, press the **MODE** button.

Otherwise, to select N and then access Throttle Level Enable Settings.

Throttle Enable/Disable Interface

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Throttle Level Enable/Disable

HF-y represents throttle level is enabled. HF-N represents throttle level is disabled. The default value is N.

To change throttle level function, press the **UP**/**DOWN** button to select Y or N.

To store a changed setting, press the **MODE** button and then access Throttle Enable Settings page.

To return to previous menu, hold the **MODE** button for 2s.

Throttle Level Enable or Disable Interface

◆**System Settings**

Delay time settings of battery power

DLY represents delay time of battery power settings. The default value is 3s.

To change delay time settings, press the **UP**/**DOWN** button to select delay time 3s, 6s, 12s.

To store a changed setting, press the **MODE** button and then access the max speed limited.

Delay Time of Battery Power Interface

Max speed limited

MAX SPD represents max speed limited settings. The default value is 40Km/h.

To change Max speed limited setting, press the **UP/DOWN** button to set the max speed from 25Km/h to 40 Km/h.

To store a modified setting, press the **MODE** button and then access Button PAS Settings.

Interface of Max Speed Limited Settings

■**This setting is the priority version. The speed is the maximum set by manufacturer.**

Button Push-assistance Enable/Disable

PUS represents button push-assistance settings. Y represents button push is enabled, N represents button push is disabled. The default value is Y.

To change button push-assistance settings, press the **UP**/**DOWN** button to choose Y or N.

To store a changed setting, press the **MODE** button and then access PAS speed settings.
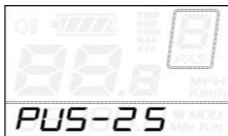

Interface of Push-assistance

PAS Speed Settings

To change PAS speed settings, press the **UP/DOWN** button to adjust from 20% to 35%,

To store a modified setting, press the **MODE** button and then access slowly start up.

The default value is 25%.

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Interface of PAS Speed Settings

Slowly Start up Settings

SSP represents slowly start up. The range is "1-4", "4" is the slowest. The default value is "1".

To change slowly start up settings, press the **UP/DOWN** button to select the desired value.

To store a changed setting, press the **MODE** button and then turn to Delay time settings of battery power page.

To return to previous menu, hold the **MODE** button for 2s.

Interface of Slowly Settings Up

◆**Power-on Password Settings**

P2, 0000 on the screen means power-on password settings. The default value is 2222.

To access the power-on password settings, press the **UP**/**DOWN** button to modify the value and then press the **MODE** button to confirm digit one by one until the correct 4-digit password is completed, and then press the **MODE** button to access power-on password enable settings interface, otherwise stay on the password input state.

Power-on Password Entering Interface

Power-on Password Enable/Disable

To change power-on password enable/disable settings, press the **UP**/**DOWN** button to select Y or N.

If it is Y, press the **MODE** button and then access power-on password modify interface, otherwise exit the power-on password settings interface. The default value is N.

Y is power-on password enable

N is power-on password disable

Power-on Password Disable Interface

Power-on Password Modify

When the display shows P3, 0000, to set new power-on password, press the **UP**/**DOWN** button to modify the value and then press the **MODE** button to confirm digit one by one until the new 4-digit password is completed.

To store the new power-on password, hold the **MODE** button for 2s and then exit settings.

When switching the eBike system on next time, the display will show P1,0000, please input the new password to power on.

Power-on Password Modify Interface

◆**Exit settings**

In the settings state, pressing the **MODE** button is to confirm the input. Holding the **MODE** button is to store the settings, and then exit the current settings. Holding the **DOWN** button is to cancel the operating but not storing settings data, and then return to previous menu.

■**If there is not any operations in one minute, the display will exit the settings state.**

Recover default settings

dEF represents recover default settings. The default value is N.

To access recover default settings, hold both the **UP** and **MODE** button for 2s and press the **UP/DOWN** button to choose Y or N again. N means that do not recover default settings. Y means that recovers default settings.

When it is Y, hold the **MODE** button for 2s to recover default settings, the display shows DEF-00 at the same time**,** and then return to general display state.

Recover Default Settings Interface

Operation Cautions

Be careful of safe use. Don't attempt to release the connector when battery is on power.

◆ Try to avoid hitting.

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◆ Don't modify system parameters to avoid parameters disorder.
◆ Make the display repaired when error code appears.

Quality assurance and warranty scope

Ⅰ **Warranty**

1) The warranty will be valid only for products used in normal usage and conditions.

2) The warranty is valid for 24 months after the shipment or delivery to the customer.

Ⅱ **Other items**

The following items do not belong to our warranty scope:

1) The display is demolished.

2) The damage of the display is caused by wrong installation or operation.

3) Shell of the display is broken when the display is out of the factory.

4) Wire of the display is broken.

5) Beyond Warranty period.

6) The fault or damage of the display is caused by the force majeure (e.g., fire, earthquake, etc.).

Connection layout

Connector line sequence
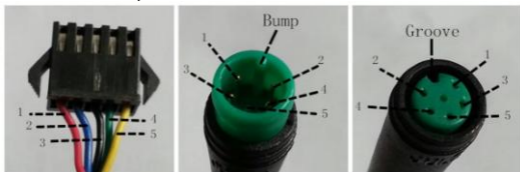
Display-side Connector   Display-side adapter   Switch wiring

Line sequence table

Line sequence	Color	Function
1	Red(VCC)	+
2	Blue(K)	Lock
3	Black(GND)	-
4	Green(RX)	RX
5	Yellow(TX)	TX

■**Some wire use the water-proof connector, users can not see the inside color.**

Attached list 1：Error code definition

Error Code	Definition
21	Current Abnormality
22	Throttle Abnormality
23	Motor Abnormality
24	Motor Hall Signal Abnormality
25	Brake Abnormality
30	Communication Abnormality

Attached list 2: Personality Parameter settings

No.	Settings item	Screen display
1	Battery Power Bar Settings	*U0t*
2	Power assistant level Settings	*SL A*
3	Over-current Cut Settings	*CUr*
4	Power Assistant Sensor Settings	*PAs*
5	Speed Sensor Settings	*SPs*
6	Throttle Function Settings	*Hnd*
7	System Settings	*SYs*
8	Power-on Password Settings	*PSd*

Attached list 3：Power assist table

Level \ Level Item	1	2	3	4	5	6	7	8	9
0-3/ 1-3	50%	74%	92%	—	—	—	—	—	—
0-5/ 1-5	50%	61%	73%	85%	96%	—	—	—	—
0-7/ 1-7	40%	50%	60%	70%	80%	90%	96%	—	—
0-9/ 1-9	25%	34%	43%	52%	61%	70%	79%	88%	96%

Attached list 4：symbol definition

No.	Symbol	Definition
1	*tC*	Trip distance clearance
2	*bL*	Backlight
3	*U*	Unit
4	*UOL*	Voltage
5	*Ld*	Wheel diameter
6	*LS*	Speed limit
7	*cur*	Controller over-current cut
8	*run-b*	Backward
9	*run-F*	Forward
10	*SCN*	Sensitivity of PAS
11	*SPS*	Speed sensor
12	*dLY*	Power delayed time
13	*HL*	Throttle power assist walk
14	*HF*	Throttle-changing
15	*PUS*	Button push
16	*SSP*	Slowly start up
17	*PSd*	Password
18	*dEF*	Recover default
19	*y*	Yes
20	*n*	No