retrospec

D16 Display

Electric Bike

DISPLAY MANUAL

I. Product description

1. Product name and model number

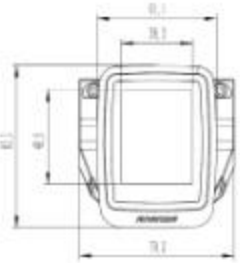
TFT Display, Model: D16 U5U

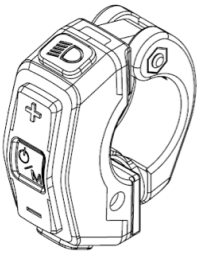
- U UART communication
- 5 Master type
- U USB port

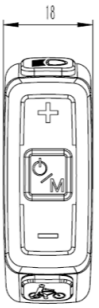
2. Product characteristics

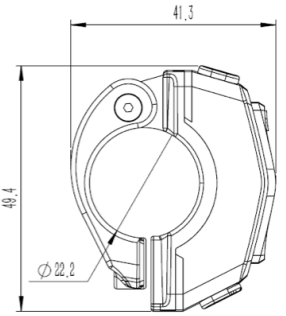
Simple and compact structure, 2.4-inch ultra-high contrast TFT screen, IPX6 waterproof capability

3. Appearance and size









II. Product specification

1. Specification parameters

1. Power supply: DC 24V/36V/48V/52V
2. Rated operating current: <50mA@48V
3. Screen specification: TFT display
4. Communication mode: UART
5. Operating temperature: -20～55°C

6. Storage temperature: -20～60°C

7.Waterproof grade: IPX6

2. Function overview

- Battery remaining indication
- Real-time speed indication
- Mileage data indication (ODO/total mileage -> TRIP/single mileage ->TRIP TIME/single mileage time -> TRIP /single mileage average speed -> TRIP /single mileage maximum speed -> Motor power ->Human power -> TRIP /single mileage average power consumption ->Instantaneous power consumption-> Range/ Remaining mileage-> Cadence-> Torque)
- Assisted level indication
- Headlight on and off
- 2.2mph Walk assisted function
- USB with charging function, output voltage/maximum output current: 5V/1A
- Turn signal
- Error code display
- Setup function display: clear, light-sensitive, speed unit, power consumption unit, language selection, factory reset, auto shutdown time, throttle settings, battery remaining indication

Read-only information display:

Motor firmware version number, motor hardware version number, motor serial number, total mileage/ODO;

Battery firmware version number, battery hardware version number, battery serial number, battery voltage, battery cycle times, battery SOH; display firmware version number, display hardware version number, display serial number

- Automatic control of backlight brightness (according to external ambient light intensity)
- Automatically control the headlight on and off (according to the external ambient light intensity)

3. Button definition

On/Off button ; Adjust level button: + Button or - Button; Walk assist button:, Headlight button:

4. Display interface

Basic display interface

1. The area shows the current remaining battery power, and the figure shows the power display grid mode.
2. The area shows the fault reminder indication.
3. The area shows the USB charging indication.
4. The area shows for turn signal.
5. The area shows the headlight status indication, including automatic mode and manual mode , and the figure shows the manual mode.
6. The area shows the speed unit indication.
7. The area shows the real-time speed value indication.
8. The area shows the ODO mileage data content indication.
9. The ODO mileage mode is displayed in the area.
10. The current level is displayed in the area.
11. Indicates the status of power assisted operation.

5. Function operation

5.1 Power On/Off

- The bike is turned on with a long press of the display "on/off" button for 2 seconds. Pressing again for 2 seconds will turn the bike off.
- By factory default, if the system is not used continuously for 5 minutes (the specific time can also be set in the parameter setting/auto shutdown time setting item), the display will automatically hibernate/sleep, and the display will turn off.

- The display will quickly show the Retrospec logo, and then enter the main interface.

Startup interface

Main interface

5.2 Real-time speed and mileage display

In the main interface, the current speed is refreshed in real time, and the mileage data can be viewed at the same time.

Short press the "on/off" button can switch the display of ODO mileage data in the following order: ODO/total mileage -> TRIP/single mileage ->TRIP TIME/single mileage time -> TRIP /single mileage average speed -> TRIP /single mileage maximum speed -> Motor power ->Human power -> TRIP /single mileage average power consumption ->Instantaneous power consumption-> Range/ Remaining mileage-> Cadence-> Torque.

OLD

Trip

Trip Time

AVG Speed

MaximumSpeed

Motor Power

Human Power

AVG Consumption

Consumption Instantaneous Power

Range

Cadence

Torque

5.3 Turning on and off the headlight automatic mode

In the main interface, you can achieve the operation of the headlight function. When the headlight is off, manually press the "headlight" button briefly to turn on the headlight; when the headlight is on, manually press the "headlight" button briefly to turn off the headlight.

Turn on headlight status

Turn on automatic headlight status

Headlights separate logo distinction:

Turn on headlight status

Turn on automatic headlight status

5.4 2.2mph Walk assisted function

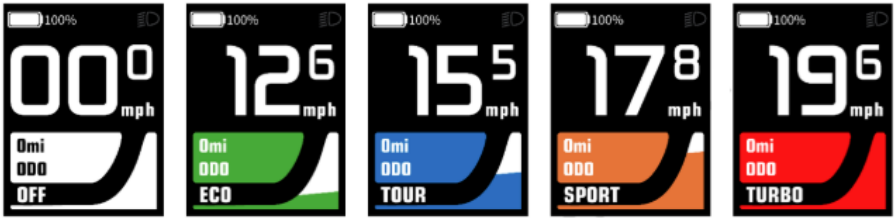
In the main interface, you can achieve the operation of the 2.2mph walk assist function. Press and hold the "Walk" button, the walk symbol will light up and enter the walk interface, indicating that walk mode is activated, then press the "Walk" button again and keep it pressed, the 2.2mph walk function will be executed; release the "Walk" button to disable the walk function. After that, press the "Walk" button again and keep it pressed, the 2.2mph walk assist function can be executed; if you release the "Walk" button, the walk assist function will be invalidated and the push assist mode will be exited. **NOTE**: Do not use this as a throttle.

Walk assisted mode

5.5 Power assist level adjustment

In the main interface, you can achieve the level operation. Short press the "+" button to increase the level, short press the "-" button to decrease the level. The assist power can be changed by increasing or decreasing the power assisting level. The range of the display's power assisting level is 0-4 levels, 0 level is no output

power of the motor, 4 levels is the highest output power of the motor. The default setting for the display when it is turned on is the same as when it was turned off last time. When selecting 0-4 levels, "OFF", "ECO", "TOUR", "SPORT", "TURBO"; and "WALK" under the walk assisted mode.



Off Eco Tour Sport Turbo

5.6 Power indication function

In the main interface, the power level is a real-time refresh display. Getting the power level information from BMS and displaying it in percentage.

Communication normal status

When the battery is fully charged, the current power status is displayed by the power progress bar. When the battery is low, the power progress bar will show the current power status, indicating that the battery is under voltage and needs to be recharged immediately.

Power full

Power low

5.7 Error code display

When there is a fault in the electronic control system (controller, display), the display will automatically display the fault code of the current latest fault in the main interface in real time, and at the same time display the red "" logo in the upper column. Only after the current fault is eliminated, the display of the error code can be cleared, and at the same time, the "" mark displayed in the upper column will disappear synchronously. (Add a main interface diagram of the error code display example.) The error code 30 must be displayed in the alarm within 5 seconds after the communication abnormality occurs in the display, and at the same time, the display will be shut down automatically after 60 seconds.

Error code display

CAN fault code	Content	Hub system maintenance process
01	Motor phase current test	1. If the line is connected properly, replace the controller. If the fault persists, replace the motor.
02	Check the busbar current of controller	1. If the line is connected properly, replace the controller. If the fault persists, replace the motor.
03	Check Holzer motor	1. Replace the controller. If the fault persists, replace the motor.
04	Check brake sensor	1. Check whether the brake handle is connected properly to the controller. If the fault persists, replace the brake handle.
05	Check controller temperature	1. In case of any fault during operation under heavy load, stop running and cool down the machine before normal operation. 2. Replace controller
06	Check motor temperature	1. In case of any fault during operation under heavy load, stop running and cool down the machine before normal operation. 2. Replace controller
09	Check the busbar voltage of controller	1. Check whether the battery power is too low. If the battery power is too low, please charge the battery. 2. If the problem is not solved, replace the controller.
30	Communication fault	3. Check whether the meter is connected properly. If the fault persists, replace the controller.
36	Dynamic torque test	1. Replace the torque sensor. If the fault persists, replace the controller.
37	Check vehicle speed sensor	1. Adjust the magnetic steel of the speed sensor according to the requirements; or replace the wheel sensor.

5.8 USB charging function indication

The menu is activated by the USB charging "on/off" function. The USB voltage output function can be turned on or off by using the menu options. The USB charging function can also be quickly turned on or off by long pressing the "+" button.

5.9 Turn signal indication

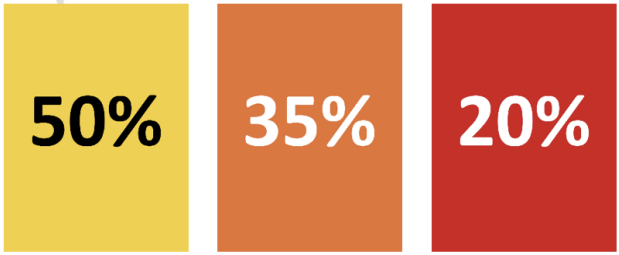
This function is paired with a remote turn signal button. If the left turn signal is turned on, display a left-turn indicator. If the right turn signal is turned on, display a right-turn indicator (upper right corner).

Turn Left

Turn Right

5.10 Battery remaining indication

When the battery level drops to 50%, the full screen displays yellow. When the battery level drops to 35%, the full screen displays orange. When the battery level drops to 20%, the full screen will display red and the reminder time will be 5 seconds. The system default Settings are 50% yellow, 35% orange, and 20% red. Users can adjust the battery level reminder ratio through the display.



6 Display parameter setting

Under the information interface, press and hold the "+" button and "-" button at the same time to enter the setting menu interface. In the settings menu, press the "On/Off" button to enter the next level menu. In the last selection menu, press the "On/Off" button to confirm the current selection. After selecting the "Back" option, press the "On/Off" button to return to the previous level interface. Setting menu interface is divided into four levels of menu settings, as follows:

Level 1 menu	Level 2 menu	Level 3 menu	Level 4 menu
Reset Trip	Yes	-	
	No	-	
Setting	Brightness	20%	-
		40%	-
		60%	-
		80%	-
		100%	-
		Auto	-
	Speed unit	km/h	-
		mph	-
	Auto Sleep	No Sleep	-
		5 Minute	-
		10 Minute	-
		15 Minute	-
		20 Minute	-
		25 Minute	-
		30 Minute	-
	Available functions	Odometer/Trip meter/Trip time/Avg.speed/Max speed Avg consumption/Inst consumption Motor power/Rider power/Range/Cadence/Turque	
	Factory reset	No	-

		Yes	-	
	Language	English	-	
		French	-	
	Consumption unit	Ah/Km	-	
		Wh/Km	-	
	USB charge enable	Disable		-
		Enable		-
	Throttle mode	Max Boost		-
		By Level		-
	Password	Status		Disable
				Enable
		Modify		-
	Low battery alert	Level1 alarm SOC		5%/10%/15%/~70%/75%/80%
		Level2 alarm SOC		5%/10%/15%~70%/75%/80%
		Level3 alarm SOC		5%/10%/15%~70%/75%/80%

Information	Motor Info	Firmware version	value
		Hardware version	value
		Serial number	value

		Odometer	value
		Wheel inch	value
	Display Info	Firmware version	value
		Hardware version	value
		Serial number	value
	Battery Info	Firmware version	value
		Hardware version	value
		Serial number	value
		Battery voltage	value
		State Of Health	value
		Charge cycles	value

The specific setting items are explained below:

Setting interface

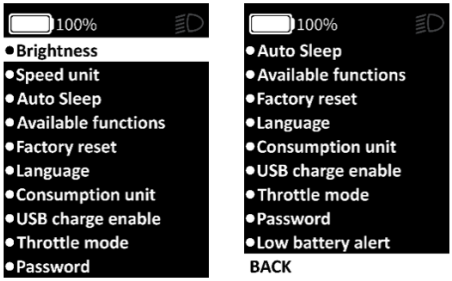
Press and hold the "+" and "-" buttons at the same time to enter the settings page, and then press the "+" or "-" button to select the switching option, and finally press the "on/off" button to confirm.

6.1 Single mileage/TRIP parameter reset

Single mileage/TRIP parameter reset option display

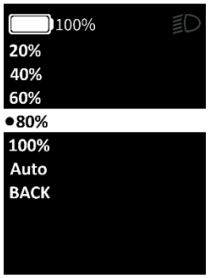
Press the "-" or "+" button to toggle the clear option. Select "Yes" and press "Confirm" to clear the data related to a single trip. Press the "On/Off" button under the "Back" option to return to the previous interface.

6.2 Setting function interface



Setting function interface

6.2.1 Light sensing parameter settings



Light sensitivity options

Short press "-" or "+" button to toggle the selection of backlight level. Short press the "On/Off" button to confirm the currently selected backlight level. Short press the "On/Off" button under the "Back" option to return to the previous interface. Press and hold the "On/Off" button to return to the main interface. The factory default setting is "80%"

6.2.2 Speed unit setting

Speed unit options

Press the "-" or "+" button to toggle the selection of speed units. Press the "On/Off" button to confirm the currently selected speed unit. Press the "On/Off" button to return to the previous interface under the "Back" option. Long press the "On/Off" button to return to the main interface. The factory default setting is mph.

6.2.3 Power consumption unit settings

Power consumption unit options

Short press "-" or "+" to toggle the selection of the power consumption unit. Press the "On/Off" button to confirm the currently selected power consumption unit. Under the "Back" option, press "On/Off" briefly to return to the previous interface. The factory default setting is Wh/mi.

6.2.4 Language settings

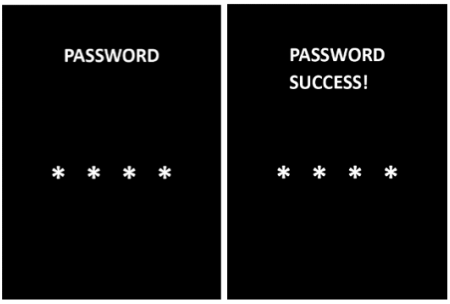
Language option

Press the "-" or "+" button briefly to switch the language selection. Press the "On/Off" button to confirm the currently selected language. Under the "Back" option, press the "On/Off" button briefly to return to the previous interface.

6.2.5 Recovering factory settings

PASSWARD is required, the default password is "**6262**", press the "+" or "-" button to increase or decrease the number, short press the "on/off" button cursor jumps to the next digital settings, and so on, enter the interface as follows after successful input:

After entering the password successfully:

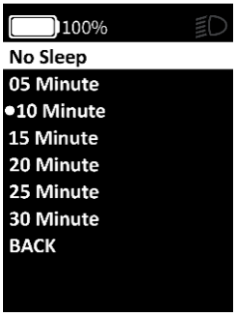


Enter the password successfully to enter the display screen:

Factory reset option

Short press the "-" or "+" button to toggle the reset option. Select the "Yes" option, then press the "On/Off" button briefly to reset all data. Select "No" option to return to the previous menu directly, the factory default position is in "No" option. Short press the "On/Off" button under the "Back" option to return to the previous interface.

6.2.6 Automatic shutdown time setting



Auto power off duration options

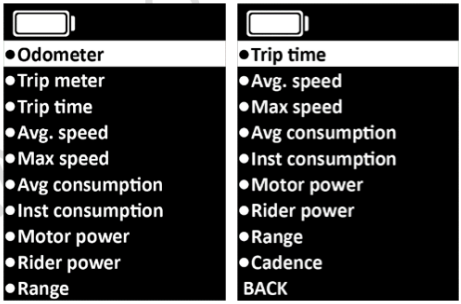
Short press the "-" or "+" button to switch the option of auto power off duration. Press the "On/Off" button to confirm the currently selected auto power off duration. Under the "Back" option, press "On/Off" briefly to return to the previous interface. The factory default setting is 10min.

6.2.7 Enable USB charging

USB charging

Press the "-" or "+" button briefly to switch the selection. Press the "On/Off" button to confirm the current selection. Press the "On/Off" button to return to the previous interface under the "Back" option.

6.2.8 Function crop settings



Functional cropping options

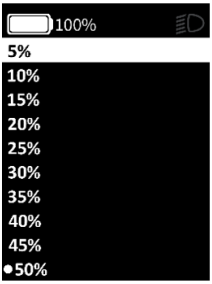
Short press the "-" or "+" button to switch to select the function option to be cropped. After selecting the option to be cropped, press the "On/Off" button briefly, you can see whether the current option is cropped or not. The symbol "○" at the front of the cropping option means canceling the current option function, and the symbol "●" means checking the current option function. Under the "Back" option, press the "On/Off" button briefly to return to the previous interface.

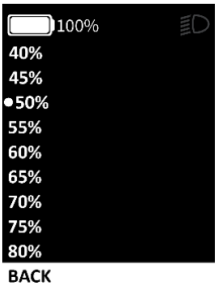
6.2.9 Throttle settings

Short press the "-" or "+" button to switch the Throttle selection option. Press the "Power On/Off" button briefly. The "Max Boost" option means that the throttle keeps the same function of each level. The "By Level" option means that the throttle gradually increases with level 1 to 4. "Back" option, briefly press the "Power On/Off" key to return to the previous interface. The default factory setting is "Max Boost".

6.2.10 Battery remaining settings

Short press the "-" or "+" button to switch and select. Press the "Power on/Off" key briefly to set the proportion of power reminder in levels 1 to 3 respectively. The selection range for each Level is between 5% and 80%. Users can set the battery level reminder ratio (e.g., 20% yellow, 15% orange, 10% red) through the meter. Please adjust it up and down according to the 5% ratio. The reminder time is 5 seconds. Under the "Back" option, briefly press the "Power On/Off" key to return to the previous interface. The factory default Settings are yellow reminder at 50%, orange reminder at 35%, and red reminder at 20%. (Note: The set proportion data should be Level 1 > Level 2 > Level 3)



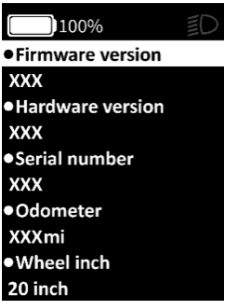


6.3 Information function interface

Read-only interface

for information of each part

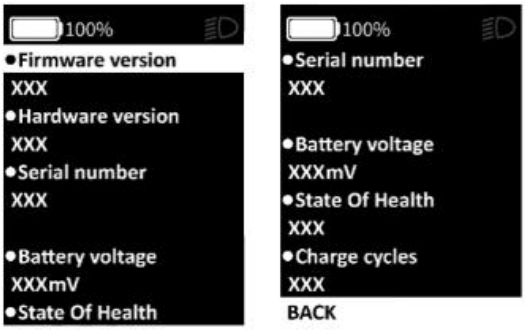
6.3.1 Motor read-only information display



Motor read-only message content

Short press the "-" or "+" button to toggle the read-only information option for the motor you want to view. Short press the "On/Off" button under the "Back" option to return to the previous interface.

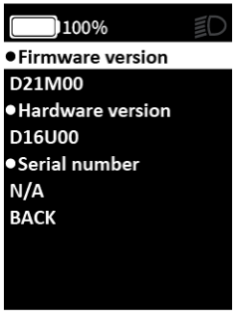
6.3.2 Battery read-only information display



Battery read-only information

Short press the "-" or "+" button to toggle the read-only information option for the battery you want to view. Short press the "On/Off" button under the "Back" option to return to the previous interface.

6.3.3 Display read-only information display

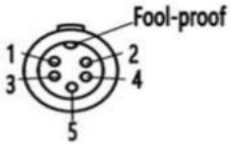


display read-only information

Short press the "-" or "+" button to toggle the read-only information option of the display you want to view. Short press the "On/Off" button under the "Back" option to return to the previous interface.

7 Wiring diagram

UART communication interface definition：



connector model	JULET JL-F-Z509AG				
Pin NO.	1	2	3	4	5
Color	Red	Blue	Black	Green	Yellow
Definition	VCC	LOCK	GND	RX	TX

III. Warnings!

1. In the process of use, pay attention to the use of safety, do not plug and unplug the display in the energized working state;

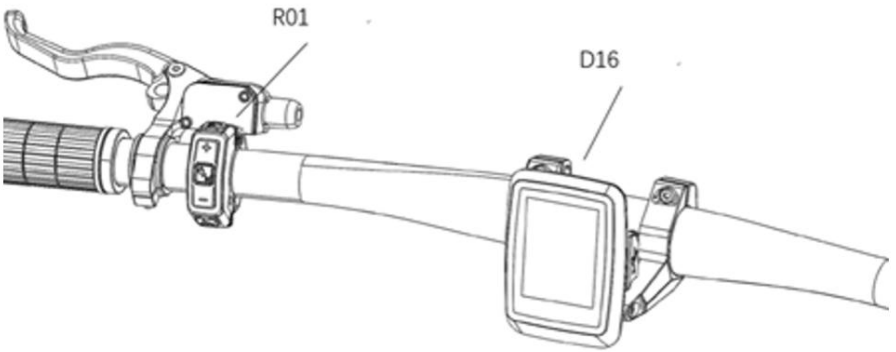
2. Try to avoid the use of harsh environments, heavy rain, snow, sun exposure;

3. When the display can not be used normally should be repaired as soon as possible;

4. Retain the authority to change the specifications.

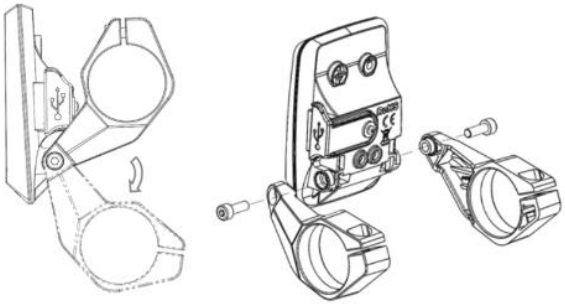
IV. Display installation instruction

Installation Example:

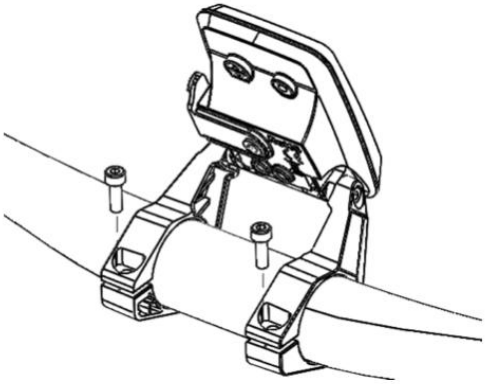


D16 display

1. Adjust the display snap ring to the proper angle, secure and tighten using M4 socket head cap screws;



2. Open the snap ring into the handlebar (standard handlebar tube specification: Φ31.8), adjust it to a position that is easy to operate, and use the M4 hexagon socket head cap screws to fix it and tighten it (maximum locking torque: 1N-m);
*display damage caused by excessive torque is not covered under warranty.

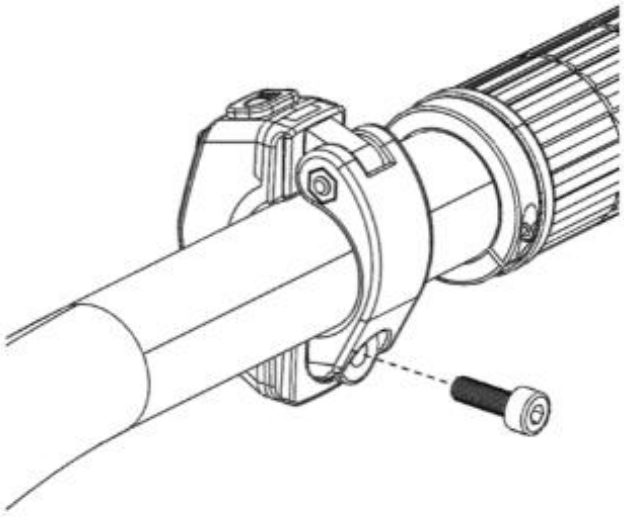


For mounting on Φ25.4 or Φ22.2 handlebars, the handlebars should be fixed with screws after inserting matching rubber pads on both sides.

3. Connect the display 5/6pin connector to the R01 button connector.

R01 button:

1. Loosen the socket head cap screw, open the button ring, put it on the left handlebar (standard handlebar tube specification: Φ22.2), adjust it to an easy-to-operate position, and then use the M4 socket head cap screw to fix it and tighten it (max. locking torque: 1N-m);
*Damage to the display caused by excessive torque is not covered by the warranty.



2. Connect the keypad 3pin connector to the D16 display butt connector.

V. Frequently asked questions and answers

Q: Why can't I turn on the display?
A: Check whether the contact between the connector of the display and controller is reliable.
Q: How to deal with if the display shows the error code?
A: First, according to the display of the error code to find the corresponding problem, if you cannot solve the problem in a timely manner take your bike to an authorized dealer.

retrospec

Contact Us

Need some help with your new gear? Just want to say “hey” and talk to someone on our team? We’re here for that too.

Give us a follow, while you’re at it:
@retrospec
#retrospec
#readytooutdoor