

LCF Technics Product User Guide

Tongsheng VLCD5 Display (6 pin)



Introduction

The VLCD5 is an intelligent control and display unit designed for electrically assisted trikes and bicycles. It's used to select power assistance level, optionally control external lights and will display battery charge level, current speed and record trip distance.



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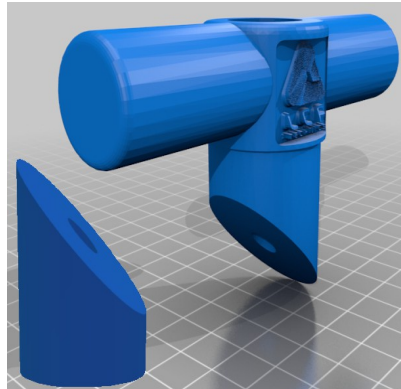
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Installation

The VLCD5 can be mounted to your recumbent bicycle or trike using the 'Trike Accessory Mount' which can be downloaded from Thingiverse for 3D printing here: **[.Trike Accessory Mount](#)**



For an standard bicycle, the VLCD5 can be mounted on the handlebars as shown.



The remote button panel should be mounted on the handlebar near the brake lever on either the left or the right side. All fittings use metric Allen keys





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Cable Connections

There are 2 models of TSDZ2:

1. **8 pin model** – for use with throttle and brake sensors.
2. **6 pin model** – for use with torque sensing motor – no throttle or brake sensors needed.

The following section covers the **6 pin** model.

There are 2 weather resistant cable connections from the VLCD5 display:



The long **6 pin** cable connects directly to the motor. The motor controller is contained inside the motor housing and a short cable with a matching connector emerges from the housing.

The connector profile has a flat side to ensure correct orientation, there are also arrows on each connector which should be aligned.

The connectors are a snug fit to resist water ingress. It is often necessary to make a slight rotating motion with each hand as you press the connectors together to ensure they are fully engaged.

The short **5 pin** cable connects to the remote button panel connector. The process of making the connection is similar in each case.

For a recumbent bike or trike, an 5 pin extension cable will be required.



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Wheel Speed Magnetic Sensor

The VLCD5 uses a magnetic pickup and a spoke mounted magnet to determine wheel revolutions. This combined with the wheel diameter allows calculation and display of current speed. The magnetic pickup is also used for calculating distance travelled.



The magnetic pickup is mounted to the cycle frame and the spoke magnet passes the pickup in close proximity on each rotation of the wheel.

Around 5 to 10mm between the pickup and the magnet is ideal but care should be taken to ensure there is no physical contact between them at any steering position or under any braking conditions.

The pickup has an arrow to indicate the correct passing point for the magnet.

The magnetic pickup yellow connector should be connected to the short cable from the motor housing that has a yellow band at the base of the connector. (There is only one cable from the motor that has this yellow band).

If you have the optional 'Y' splitter connector as shown in the image: The second yellow plug can be used to allow remote control of 6 Volt external lights. Both plugs on the 'Y' splitter have the same pinouts and either plug can be used for the motor housing yellow band connector or the 6 Volt external lights. Lighting cable is shown below.



Display Panel Layout





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VLCD5 Features

1. Speed display - Reads out the current speed in Kph or Mph as configured.
2. Battery Level indicator - 4 block indication of battery charge level - each block represents approx. 25%. The level indicator flashes when the battery is low.
3. Trip distance - reset on power off.
4. Odometer - Total miles from new.
5. Trip Time - Time in use for the current trip.
6. Average speed (AVG)
7. Power assist level - Eco, Tour, Speed, Turbo or off.
8. Backlight - off (default) or on. Also turns on optional external lights if fitted.
9. Wheel-diameter setting - in inches - range 14 - 32. 26 is default. The diameter setting must be correct for speed and range function accuracy.
10. Magnetic pickup sensor setting – Number of spoke magnets – default is 1.
11. Speed units - Select imperial (Mph) or Metric (Kph).
12. Walk assist / 6kph setting - ON or OFF - default is OFF.
13. Maximum assist speed limit - Default is 25Km/h
14. Assist ratio setting (reserved) - Default is 16.
15. Zone setting (reserved) - Default is Europe.
16. Software version - Displays current firmware version.
17. Error code - System does a power on self test - detected errors display a code.
18. Torque signal value (reserved) - Current torque value readout.
19. Initial torque value (reserved) - Initial torque signal value displays.

VLCD5 Operation



1) **Power:**

Press this button to power on the LCD display. Press and hold the button for 2 seconds to power off. The display will power down after 5 minutes of inactivity.

Important: Do not touch or move the pedals during initialisation.



2) **Assist level selection:**

There are 4 levels of assistance. Press the +/- buttons to adjust the power assist level. The default is ECO (min). TURBO is max (300%).



3) **Toggle mode selection:**

There are 4 selectable modes.

- Odometer
- Trip Distance
- Average Speed
- Trip Time

Press the info button to change/toggle through the available modes. Default is odometer.



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Basic Operations

Backlight & External Lights



Quick press the power button to switch background lighting and optional external lights.

Odometer (ODO)



In ODO mode, press and hold all three buttons simultaneously for 10 seconds to reset counters to zero.

Trip distance (TRIP)



In Trip Distance mode, press and hold the button for 2 seconds to reset to zero.

Average speed (AVG)

In Average Speed mode, (average speed = trip distance / movement time).

Speed resolution is 0.1 kph (mph),

Trip Time (TIME)

In Trip Time mode, time for the current journey is displayed.

Diagnostic Code



If the controller encounters an error, the relevant code will be shown in the 'current speed' section of the display.



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Specifications

Type	VLCD-5
Working voltage	DC 11V-60V
Max working current	70mA(11V) 32mA(50V)
Display type	21*4 segment LCD
Measuring the speed	1-12 pulses each rotation of wheel
Working temperature	-20 ⁰ C—+70 ⁰ C
Backlight	White LED mode, brightness:200cd/m ²
Dimensions	102.5mm×75.5mm×28mm (exclude thickness of Pedestal)

VLCD5 Wiring Colours

- 1、 Orange (RX)
- 2、 Brown (TX)
- 3、 White (Weak current)
- 4、 Green (Power)
- 5、 Black (Earth)
- 6、 Purple (Brake)

IP protection level – IP65



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Technical Service Menu

The VLCD5 contains a service menu that should only be used by qualified service personnel. It is not normally necessary to access this menu other than for initial setup and system configuration.

To enter the service menu:

At the first screen after initialisation: Press the Power and Information buttons simultaneously until **SEr** is displayed, then release both buttons,



Then quickly press the information button 4 times in succession (full cycle through 'Toggle Modes').



This will bring you to the Service Menu.(**d1** is displayed).

The LCD will exit the service menu after a few seconds without user input.

There are 8 modes in the Service Menu in addition to the normal 4:

1. Odometer (*default*)
2. Trip distance
3. Average speed
4. Trip time
5. Wheel diameter selection
6. Spoke magnet number selection
7. Imperial/Metric unit selection,
8. Walk assist (6Kph) function selection,
9. Assist limit selection
10. Power adjustment selection
11. Zone Mode selection. (Preset).
12. Software Version display.



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Service Menu Modes

Wheel diameter selection(d1)

Use the *i* button to enter the speed selection, press **+** or **-** buttons to choose the correct diameter. The default is 26".

d1

0026

Spoke magnet number selection(CC)

Use the *i* button to enter the Spoke magnet number selection, press **+** or **-** buttons to choose the no. of magnets 1-12. The default is 1. The no. represents the number of pulses from one complete rotation of the wheel.

CC

0001



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Imperial/Metric units selection(km/h mile/h)

Use the *i* button to enter the Imperial/Metric units selection, press **+** button to switch between kph and mph. The default is Kph.

888.8 km/h
mile/h

Walk assist (6Kph) function selection

Use the *i* button to enter the walk assist (6Kph) function selection, press **+** button to switch between ON/OFF. Default is OFF.

When enabled: press and hold the **-** button for 3 seconds to start the 6 Kph motor rotation – walk assist.





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Speed limit setting (SD)

Use the *i* button to enter the speed limit selection, press **+** or **-** buttons to set the speed limit.

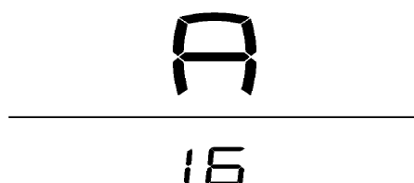
15-45. The default is 25Km/h.



Power setting (A)

Use the *i* button to enter the power adjustment submenu, press **+** or **-** buttons to change (6-35)

The default is 16.

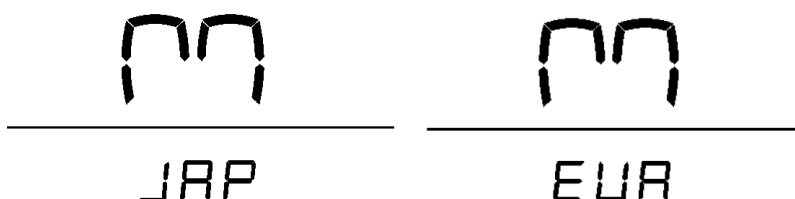




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Zone mode setting (M)

Use the *i* button to enter the Zone mode submenu, press **+** button to switch between Japan and Europe. Default is Europe.



Software version 3.7

Use the *i* button to show the current version is 5.0.





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Fault Codes

If there is a fault, the display will show an error code – see below.

ERR-02 Motor hall fault or motor short circuit

ERR-03 Controller failure

ERR-04 Throttle failure

ERR-08 Low battery alarm

ERR-06 Turn on the motor with cyclist's feet on the pedal for coaster brake version

Troubleshooting:

Problem	Checks
Display will not power on.	Check battery cable connections and battery charge level.
Motor assist power is weak or intermittent.	Restart VLCD5 unit – avoid touching pedals during initialisation.
Motor assist drops off in use – display remains on.	Check magnetic pickup and spoke magnet positions. Verify alignment and distance between them.
VLCD5 is not displaying speed.	Check magnetic pickup and spoke magnet positions.
Speed display shows incorrect speed reading.	Verify correct wheel size is selected in settings – it should be the wheel size of the 'spoke magnet' wheel.
VLCD5 display and motor assist turns off in use.	Check for intermittent battery cable connections to motor and full engagement of display connectors.



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EC Declaration of Conformity

We hereby declare that the product described, in its design, construction and in the form as delivered by LCF Technics Limited complies with the essential health and safety requirements of the EC directives.

Identification of products / product types

- Article LCF-P0550A Tongsheng Display VLCD-5

This product complies with the following EC directives

- 2001/95/EC DIRECTIVE FOR GENERAL PRODUCT SAFETY
- 2004/108 / EC DIRECTIVE FOR ELECTROMAGNETIC COMPATIBILITY

Applicable standards

- EN15194:2017/ CE/ RoHS: Cycles - Electrically power assisted cycles - EPAC Bicycles

This declaration of conformity is issued under the sole responsibility of:

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