



DM08 Top Tube Embedded Display Functionality Introduction

Product Name: Top Tube Embedded Display

Product Model: DM08



	Signature	Date
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Revision History

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Declaration

DM08 functional definition is a function definition description of the standard-version DM08 display produced by Velofox , and is part of the technical documentation.

All of Velofox's display products are customized according to the electric system's requirements. While this document is a reference for complete function definitions, operation instructions, and error codes, any configuration difference between your display and the standard DM08 is possible, due to various technical requirements in different ebike applications. Please consult your drive system supplier for additional function requirements and data display.

If you have any questions about DM08 functional definition, please consult our sales or technical support team.

Our company (VeloFox®) reserves all the rights to interpret and explain DM08 functional definitions.

Hangzhou Velofox Intelligent Technology Co., Ltd



A. Product Introduction

1. Product name and model

Top Tube Embedded Display for Electric Power Assist Bikes

Product model: DM08

- DM08 includes two versions of UART communication and CAN BUS communication
DM08_U corresponds to UART communication version;
DM08_C corresponds to CAN BUS communication version.
- All DM08 products are equipped with built-in hardware that supports master-slave mode Bluetooth functionality.

2. Product introduction

- ✧ The entire unit is made using liquid silicone integrated molding, compatible with various curved top tubes, eliminating the need for top tube profile inlaying processes.
- ✧ Simple fixing structure, suitable for installation on carbon fiber and aluminum alloy frames.
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- ✧ Integrated button design for excellent tactile feedback.
- ✧ Fully encapsulated design for IP67 waterproof rating.
- ✧ Built-in master-slave integrated Bluetooth module, allowing multiple Bluetooth devices to connect simultaneously.
- ✧ Buttons can be independently extended, with optional button configuration solutions.
- ✧ Compatible with CAN-BUS and UART communication.
- ✧ Equipped with a Type-C diagnostic interface, supporting Service Tool functionality for fast firmware upgrades and parameter settings, facilitating maintenance services.

3. Range of application

Suitable for all E-bikes that comply with EN15194 standard

4. Appearance and size

The shell material of DM08C is PC+ABS, Combined with the embedded top tube design, it is mainly suitable for road, gravel, and MTB bikes.



For detailed frame hole dimension diagrams, please contact our sales support department. We will provide detailed drawings for hole dimensions and installation.

5.display coding rules

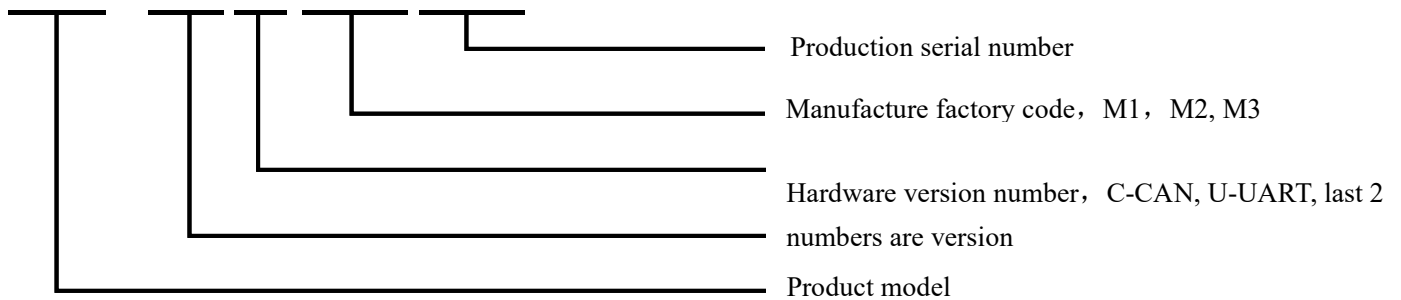


DM08 -C01M120140001

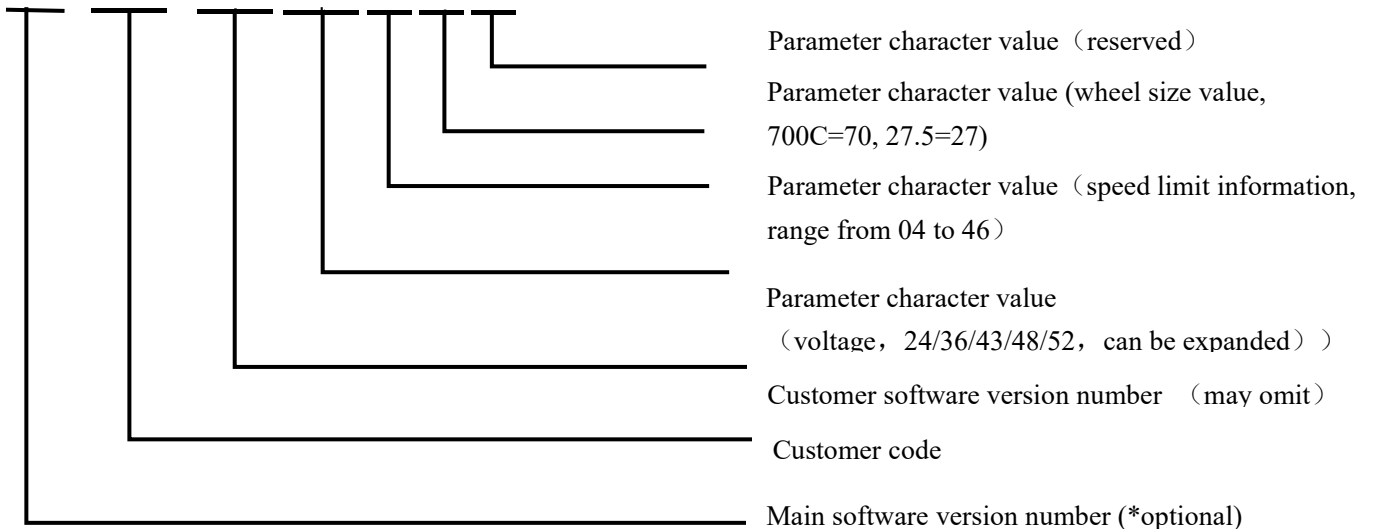
V001. XXX-24VA26

As shown in above picture:

DM08 -C01M120140001



V01. XXX. XX-24V2526XX



B. Product manual

1. Specifications

- ① Power supply: DC 24V/36V/48V/72V
- ② Rated current: 12mA@36V
- ③ Shutdown leakage current: <1uA
- ④ Screen specification: 6-LED Color Indicator Lights
- ⑤ Communication method: UART/ CAN-BUS
- ⑥ Operating temperature: -20° C ~ 60° C
- ⑦ Storage temperature: -20° C ~ 70° C
- ⑧ Waterproof level: IP67

2. Function overview

- ① 2 buttons, ergonomic design
- ② Five-Level assist power adjustment
- ③ Battery indicator with percentage display
- ④ Error code display function

3. Installation

- ① Insert the head mounting clip into the top tube and push the display to the end.
- ② Align the display's screw side with the top tube's screw holes, and secure it using an M4 star screwdriver. (Tighten the screws with a torque of 0.8 N • m.)

***Note: Damage caused by excessive torque is not covered by the warranty.**

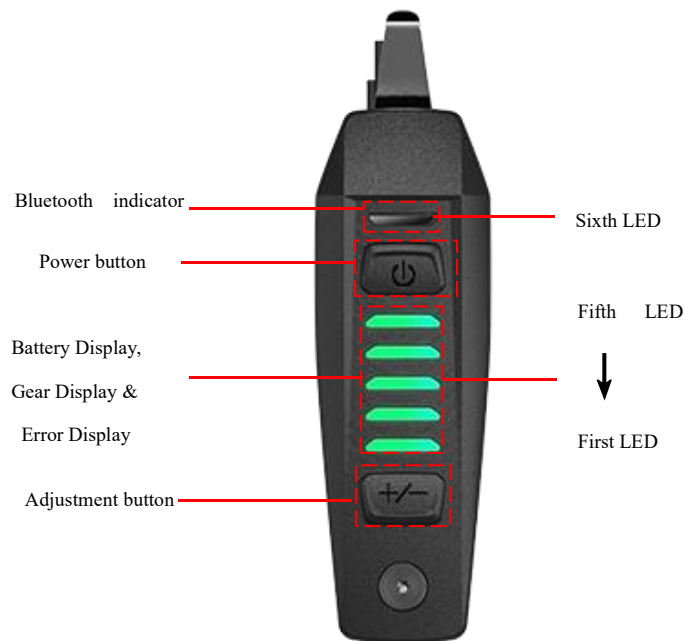
4 .Interface





4.1 Boot interface



Upon powering on, all LEDs will light up simultaneously. Then, the bottom five LEDs will sequentially light up in a running light pattern for two cycles. After establishing a communication connection, the device will retrieve battery and gear information from the controller, displaying the actual data. The color of the lights represents different gear levels, and the number of lit LEDs corresponds to different battery levels. (Customizable according to customer requirements.)

4.2 Basic interface and operation





- ①  Power On/Off Operation;
- ②  LED indicators display battery, gear, and error information based on the controller's feedback;
- ③  During riding, assist power levels can be adjusted, and settings can be changed using the function switch key.
- ④  Bluetooth indicator: Blue light indicates successful Bluetooth connection.

4.3 Definition of button operation


Operation Type	Description
Short press	Press the button and soon released, while the button is released,the function activated accordingly。
Long press	Press the button and hold, when the hold time exceeds the setting time(generally 2 seconds), the function activated accordingly.

5. Basic function operation

5.1 Turn on/off the display

Ensure the display remains properly connected to the controller. When the display is powered off, press and hold the  button. All LEDs will light up simultaneously for 1 second, followed by a running light effect where each of the bottom 5 LEDs turns off sequentially after 1 second. Then, the actual battery and gear information will be displayed based on the data retrieved. In the powered-on state, long-press the  button to power off. Before shutting down, the bottom 5 LEDs will follow the same running light effect as described above. If no operation is performed by the rider within the set shutdown time, the speed is 0, and the bus current is less than 1A, the display will automatically power off within the designated time.

5.2 Assist level switch

Press the  button to switch assist levels, changing the assist mode. There are 5 assist levels (1-5).


Different assist levels correspond to different LED light colors:





0th gear: White; 1st gear: Yellow; 2nd gear: Green;



3rd gear: Sky blue; 4th gear: Deep sea blue; 5th gear: Purple

(The image is for reference only; the actual light effect may differ.)

Gear shifting is cyclic, meaning after reaching the 5th gear, pressing  again returns to the 0th gear.

Short press  to shift up a gear, and long press  for 1 second to shift down a gear.

5.3 Light control function

When the battery is installed and the vehicle is powered on, a short press of the  button will turn on the headlights. A second short press of the  button will turn off the front light. In the headlight-on state, the brightness of the display's LED lights will be reduced by 30% to distinguish the headlight status.

5.4 Bluetooth Indicator Light

When Bluetooth is not connected, the sixth indicator LED will remain off. Once a Bluetooth device successfully connects to the display, the sixth LED will light up in blue.




蓝牙未连接



蓝牙连接效果







5.5 Bluetooth Pairing Operation

When the vehicle is powered off, press and hold the  power button for more than 5 seconds. Upon release, the sixth battery indicator LED will blink blue at a frequency of 2Hz, signaling that the display has entered Bluetooth pairing mode. After a successful pairing, the sixth LED will stay solid blue. If no connection is made within 30 seconds, the sixth LED will blink red three times before turning off, indicating the pairing attempt has failed.

5.6 Battery power indicator and assist power output

The battery level is indicated by the number of LED lights displayed.

The following table shows the correspondence between the battery capacity percentage and the battery level display icon (requires battery percentage data provided by the BMS or controller):

SOC	Battery level	Description
$80\% \leq \text{SOC}$		Full battery level 5
$60\% \leq \text{SOC} < 80\%$		Level 4
$40\% \leq \text{SOC} < 60\%$		Level 3
$20\% \leq \text{SOC} < 40\%$		Level 2
$5\% \leq \text{SOC} < 20\%$		Level 1
$0\% \leq \text{SOC} < 5\%$		Red LED flashes at 2Hz during undervoltage.

6. Error information

The display can provide a warning of vehicle malfunctions, When a fault is detected, the first and second LEDs will flash red in combination to indicate the error. For example, to report error code 24, the first LED flashes twice, then stops, followed by the second LED flashing four times. After a 2-second pause, the cycle repeats with the first LED flashing twice again and the second LED flashing four times.

Fault codes are displayed as follows:



error code information table:

Error code	Error description	Suggest operation
04	Throttle not returning	LED 2 flashes 4 times
05	Throttle failure	LED 2 flashes 5 times
07	Overvoltage protection	LED 2 flashes 7 times
08	Motor Hall signal line failure	LED 2 flashes 8 times
09	Motor phase line failure	LED 2 flashes 9 times
11	Controller temperature sensor failure	LED 1 flashes once, alternating with LED 2 flashing once
12	Current sensor failure	LED 1 flashes once, alternating with LED 2 flashing twice
13	Battery internal temperature failure	LED 1 flashes once, alternating with LED 2 flashing three times
14	Motor internal temperature failure	LED 1 flashes once, alternating with LED 2 flashing four times
21	Speed sensor failure	LED 1 flashes twice, alternating with LED 2 flashing once
22	BMS communication failure	LED 1 flashes twice, alternating with LED 2 flashing twice
30	Communication failure	LED 1 flashes three times

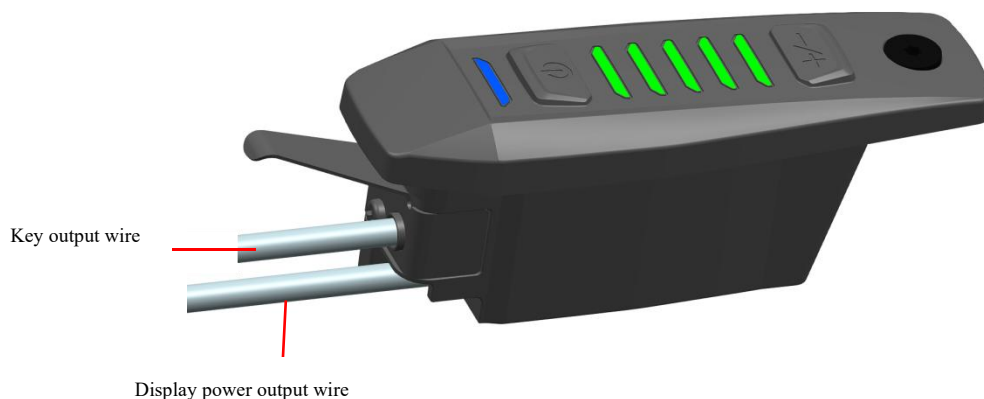
7. Key Selection Recommendations

Remote	Product images			
	Product name	RM01	RM05	RM07 (Bluetooth Key)
	Button	Four keys: power on/off (power button)/M key/+ key/- key	Add +/-/subtract - key	Add +/-/subtract - key

8. Wire definition

Our company has defined the standard output wiring for the display according to conventional applications. This standard output requires matching the corresponding conversion harness. We have specific standards for the length and interface of the conversion cables. If the standard configuration does not meet the requirements, a custom conversion cable will be needed.

The output wiring configuration of the standard sample is shown below:



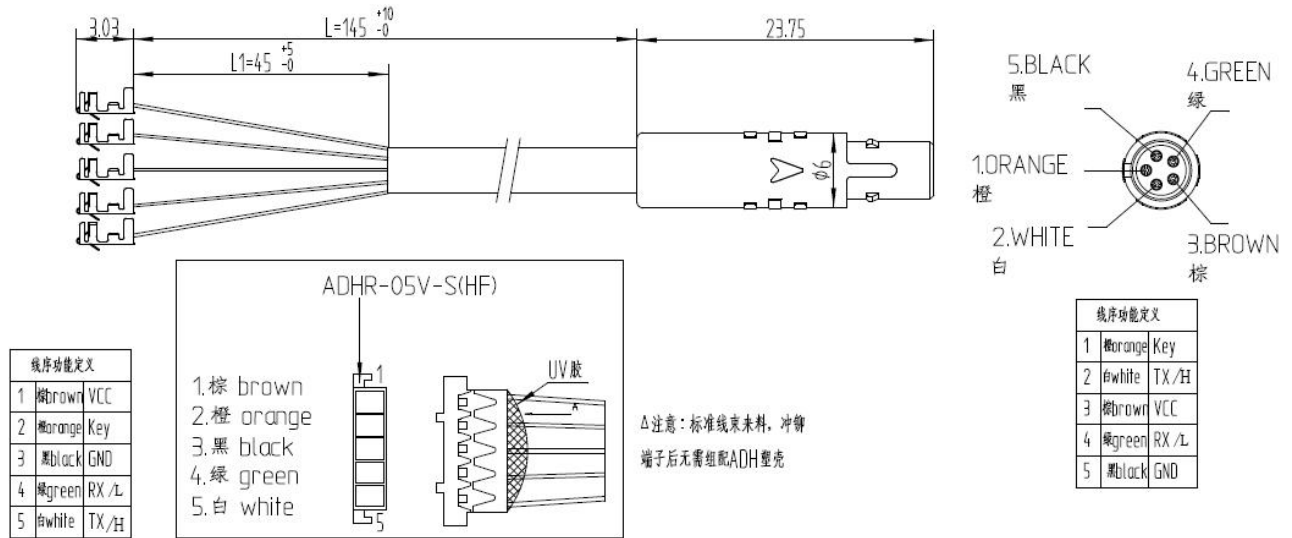


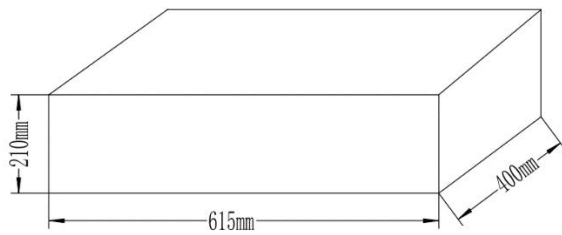
Table 1 Standard wire definition

No.	Color	Function
1	Orange(KP)	Power lock control wire
2	White(TX/CAN-H)	Display data transmission wire
3	Brown(VCC)	Display power wire
4	Green(RX/CAN-L)	Display data reception wire
5	Black(GND)	Display ground wire
6

C.Package specifications

Standard delivery, in double corrugated box packaging. The inner layer is a double corrugated septum plus EPE foam product bag.

Outer box size: 615*400*210mm (L*W*H)



D.Note

- ✧ In the use of the display, pay attention to the security, do not plug the display in and out when the power is on;
- ✧ Try to avoid exposure in harsh environments like heavy rain, heavy snow, and strong sunlight;
- ✧ When the display can't be used normally, it should be sent to repair as soon as possible.