Smart eBike
Drive system
User guide

www.minshine.cn

Catalog

1 Read me

★ Thank You for Purchasing our Smart ebike Driving System Equipped Bicycle, Read this manual before you take the first ride on your new bicycle and keep it for reference .

★ Contact dealer or the bicycle manufacturer if you can not understand this manual *,Failure to follow this manual may be involved in risk or hazardous injury.*;

★ This manual is based on the general purpose. some of the content may not be applicable due to software updates or customization.

★ Some graphics shown in this manual is from T154 display but will be similar enough with other model display to help you under-stand our instructions

★ The communication between display and controller had been encrypted with different code, so we strongly recommend you that do not purchase display or controller from other suppliers and replace it by yourself.

★ If you want to use APPs for some advance applications, You can download APPs from our website as free , and you have to buy special USB dongle from us otherwise these APPs will not work;

★ Computer system may ask you to install drive software for this USB Dongle when connecting with your PC first time, you can download this drive software pack from our website, and install it properly. There have 2 models USB Dongle , USB-D1 is only for display and USB-C1 is only display.

★ The copy rights of all of these APP belong to us , you can not spread it without our permissions.

★ *For your sfety ,Make sure to not be distracted by the display while riding , focus exclusively on your riding environment.*

2 Technical Data(T154 Serials)

◆ Power: 15 - 60VDC /50 ma
◆ Screen: 1.54" Colorful TFT
◆ Button: Transparent silicon rubber with LED Backlight
◆ Fix Position: Left or right of handlebar
◆ Communication: UART/TS232/CAN
◆ Material: ABS
◆ Ingress Protection: IP54(dust and splash water protected)
◆ Customization   :Valiable
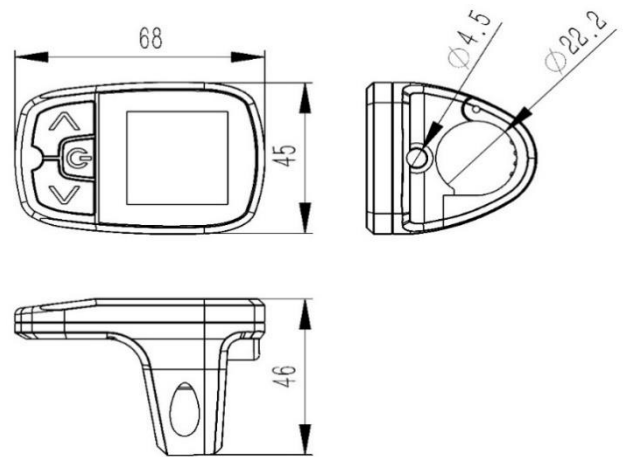
T154-1   T154-2   T154-3

#		#	
1	Brake Indicator	11	Power bar
2	Riding mode Indicator	12	Real time speed value indicator
3	Bike Speed	13	Assistance level indicator
4	Throttle or PAS Driving value bar	14	Assistance Power on or off indicator
5	Cruise indicator	15	Double battery system indicator
6	Walk Assistance Indicator	16	Information indicator
7	Battery Capacity indicator	17	UP button
8	PAS or Torque sensor activated indicator	18	Power button
9	Throttle activated indicator	19	Down button
10	Light indicator	20	Light sensor

3 Technical Data(T24 Serials)

- ◆ Power: 15 - 60VDC /60 ma
- ◆ Screen: 2.4" Colorful TFT
- ◆ Button: Transparent silicon rubber
                 with LED Backlight
- ◆ Fix Position: Middle
- ◆ Communication: UART/TS232/CAN
- ◆ Material: ABS
- ◆ Ingress Protection: IP54
  (dust and splash water protected)
- ◆ Customization :Valiable
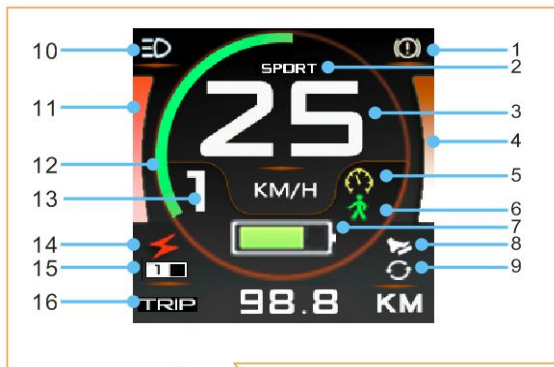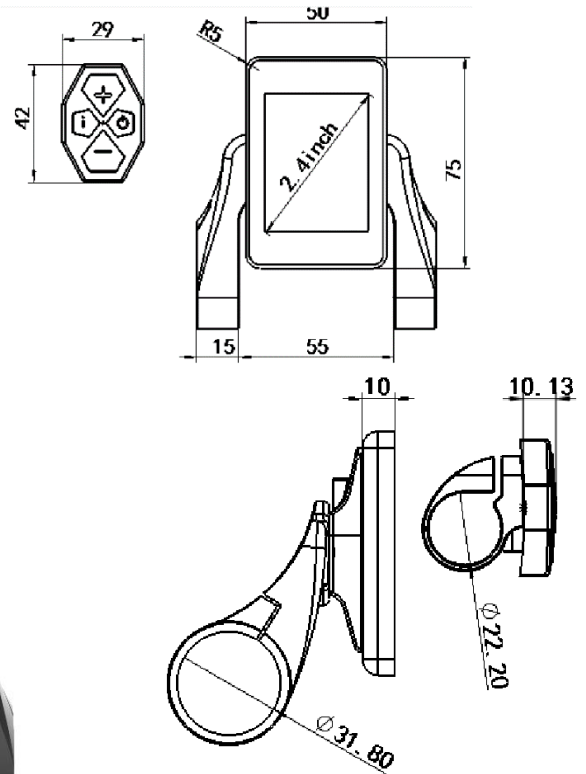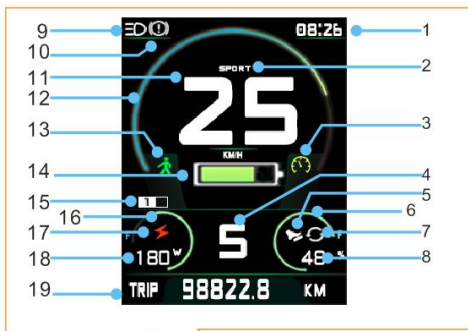
T24-V1   T24-V2

T24-H1   T24-H2   T24-H3

1	Colock	13	Walk Assistance Indicator
2	Riding mode Indicator	14	Battery Indicator
3	Cruise indicator	15	Double battery system indicator
4	Assistance level indicator	16	Power indicator
5	PAS activated indicator	17	Power indicator
6	Drive indicator	18	Power value
7	Throttle activated indicator	19	Information indicator
8	Input Drive Value	20	UP button
9	Light indicator	21	INFO button
10	Brake indicator	22	DOWN button
11	Bike speed	23	POWER button
12	Bike speed	24	Light sensor

4   Technical Data(M15)

◆   Power: 15 - 60VDC /50 ma
◆   Screen: 1.54" monochrome
◆   Button: Transparent silicon
                              with LED Backlight
◆   Fix Position: Left or right of handl
◆   Communication: UART/TS232/CAN
◆   Material: ABS
◆   Ingress Protection: IP54
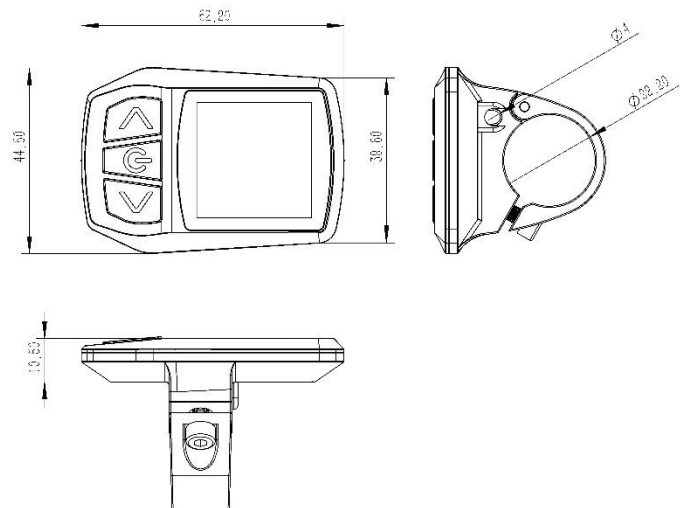   (dust and splash water protected)
◆   Customization :Valiable
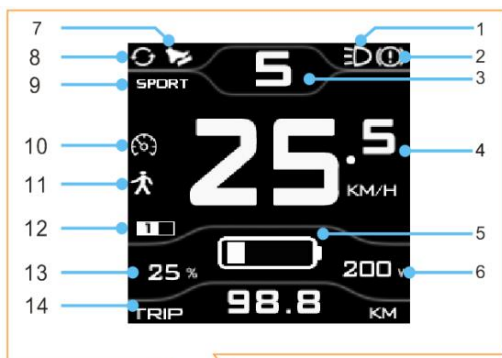
1	Light indicator	10	Cruise Indicator
2	Brake indicator	11	Walk assistance Indicator
3	Assistance level indicator	12	Double battery system indicator
4	Speed	13	Drive value
5	Battery Indicator	14	Power indicator
6	Power Indicator	15	Power value
7	PAS indicator	16	Information indicator
8	Throttle indicator	17	UP button
9	Ride mode indicator		

5 Operations

Caution:

Stop Bike if you want to make some operations on display , If you do not focus exclusively on your riding environment, you risk being involved in an accident.

Power on & off

--Long press POWER button with 3 seconds ;   user have to input password after power on if system was activated with password protecting function.

Bike light on & off

--Long press UP button with 3 seconds ,there has 3 options for light on or off , Manual ,Auto-Manual, Auto, LIGHT SENSOR will detect the environmental light intensity and turn the light   on or off automatically if select Auto-Manual, Auto options

Switching Assistance level

--Short pressing UP to increase assistance level or DOWN button to decrease assistance level .   the maxim assistance level can be set from 1 to 8 .
usually more bigger level means more powerful and more speed;
--The motor assistance is switched off at Zero Level ,
-System will automatically adjust the power and motor speed according to the bike speed at A level
--Motor will run backwards at R level
--Motor will have more power at C level when use pedal sensor up hill
--Three special level REVERSE , AUTO and Climb Level can be activated by menu options

Walk assistance

--The walk assistance can make it easier for you to push the eBike. The assisting speed can reach a maximum of 6km/h , Using the walk assistance function is only recom-mended when pushing the eBike.

Cruise

--Long press DOWN button when bike speed is more than activated speed and power assisting is on , then ,bike will start cruise.

--Pull brake or move the pedal or pull the throttle or press any key on display will cancel cruise
--Caution: There is risk of accident if you didn't concentrate on riding

Switching riding mode

--Three riding mode is ,ECO ,CITY ,SPORT, you can select desired mode by both long press POWER and UP button(**T154 or M15**). Press Info button(**T24**)

--ECO : Effective assistance at maximum efficiency for maximum cruising range
--CITY : Uniform assistance with long cruising range
--SPORT: Powerful assistance for sporty off-road riding, as well as for urban traffic

Clear Trip

--Both long press POWER and DOWN with 3 seconds , Trip meter will be cleared to zero

TRIP , ODO ,MAX SPEED , AVG SPEED

--These information was shown at bottom of screen ,TRIP and MAX SPEED , AVG SPEED can be cleared by long pressing POWER and DOWN with 3 seconds;

Bike information

--Short press POWER button can switch the bike info show at bottom of screen , bike info include TRIP , TRIP TIME , ODO ,MAX SPEED , AVG SPEED ,TEST SCREEN , ABOUT,(Clock set for T24)

ODO	16258	KM
TRIP	656.5	KM
MAX	26	KM/H
AVG	21	KM/H
⌃	TEST	
⌄	ABOUT	

ABOUT

-- Press DOWN bottom when the ABOUT show on information indicator and short press POWER button can show different interface below

--**Product information**
   Show Version number, model of the product , service distance and Password

--**Presentation mode**
   Once enter this interface ,it can help you fully know how it works and different skins and different font color will repeatedly show on screen.

Setting menu

--Both long pressing UP and POWR button after system power on within 3 seconds
--Password need be imputed if menu password protection option was activated.
--incorrect setting may cause bicycle can't work or make components failure.

--Maybe you can't modify settings because you don't have modify permissions;
--Some menu item may will be invisible

TEST

-- At this interface , you can check the status of all the components with details. which was connected with system .
--Pressing UP bottom when the TEST show on information indicator,
-- short pressing POWER button can repeatedly switch such interface below
--**Realtime Voltage and current and power**

CONTROLLER		
VOLTAGE	36.5	V
CURRENT	0.0	A
POWER	0.0	W

-- **Motor information**
Notice: you also can get correct motor reduction ratio when an unknow motor come to you.

MOTOR		
SPEED	0	RPM
REDUCTION RATIO	4.3	
HALL	AVAILABLE	

-- **Battery information**

BATTERY		
TOTAL CONSUME	0.0	AH
SINGLE CONSUME	0.0	AH
TIMER	0	MIN

-Pedal sensor status and throttle status

THR & PAS		
THROTTLE	0.0	V
PAS SPEED	0.0	RPM
DRIVE VALUE	0	%

-- Brake ,speed and shift sensor status

| SENSOR	
BRAKE	OFF
SPEED	OFF
SHIFT	OFF

--Temperature sensor

TEMPERATURE	
AMBIENT	25.2 °C
CONTROLLER	38.5 °C
MOTOR	48.5 °C

Notice: not all of system was equipped with Temperature sensor ,and temp value is only for reference

-Time set (Only for T24)

--Select Skin

Three different color skins were preset in display, you can chose favorite one for yourself

SCREEN SKIN
25 KM/H
UP <+>   DOWN <->
POWER <BACK>
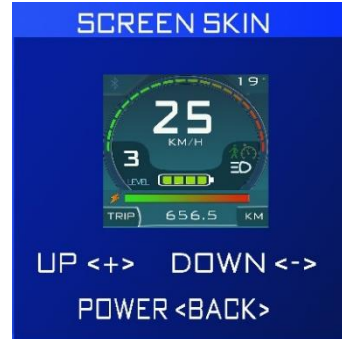
--Select Font Color

three different font solutions were preset in displat, you can chose favorite one for yourself

FONT COLOR
25 KM/H
UP <+>   DOWN <->
POWER <BACK>

As the skins and font color , you also can use our APP to make special color for you if three preset solutions are not enough for you

6 Menu Settings

This is a full menu sets for T154,M15,T24 display , not all of the menu item will be visible for end user because some settings is only for some advance applications ,sometimes, maybe you can't modify set because you didn't get permissions from supplier , all menu items show with letters , it can help to understand the meaning of each item easily, if you do not fully understand it , DON NOT CHANGE SETS ,incorrect set may make system failure.

Main Menu	Menu Item	Value range	Remark
Normal	Wheel Size	4"—30"	Rim size of the bike
	Unit	Metric, British	Unit of spend and distance
	Fix Position	Right, Left	Select RIGHT if display was fixed at right side of handle bar , Select LEFT if display was fixed at left side
	Riding Mode	ECO,CITY,SPORT	Ride mode
	Light	Manual, Auto/Manual, On	**Manual** – Power on off by UP button only **Auto/Manual**,-Auto power on off according the light sensor **ON –** light will be always on when bike power is on ,can not power off the light by UP button
	Max Speed	10km/h80km/h	Max speed of bike
	Max Push Speed	4km/h-10km/h	The max walk assisting speed
	Password	Disable , PowerON, Menu	**Disable** - No password protect **PowerON** -You have to input a password after bike Power ON **Menu** - You have to input password before setting Default password :1234
	SpeedAutoTrace	Disable, Enable	Auto trace the speed of bike
	AutoPowerOffTime	3-20Minutes	If the eBike is not moved and no button is pressed on for this period , the eBike system will shut off automatically in order to save energy, default is 3 minutes
	Warning Mode	Disable, Enable	Disable or Enable show warning message when a warring message comes

	Synchro Mode	Controller, Display, Display Once	There have 2 same copies of settings related with the bike ,2 copies was saved in both display and controller , display and controller will verify each other when bike power on, if select **Controller** - controller will send settings to display if the settings in display is different with controller **Display** - Display will send settings to controller if the settings in controller is different with controller **Display Once -** Display will send settings to controller if the settings in controller is different with controller only once , after sending finished , Synchro Mode will auto switch to **Controller Mode**
	Max Current	5-50A	***The max current is depend on controller hardware, you cant increase the max current more than rated current***
Battery	Voltage	24V,36V,48V.	Nominal voltage of battery
	Empty	29.5v	We use OCV mode to measure the capacity of battery , it's better to consult your battery supplier to fill these correct values
	20%Cap	31v	
	40%Cap	32v	
	60%Cap	33v	
	80%Cap	36	
	Full	38	
Motor	Style	Front/Rear , Middle	**Front/Rear** - for rear and front motor **Middle – for middle drive system**
	Hall	With Hall , without Hall	With Hall – if motor has hall sensor **without Hall -** if motor does not have hall sensor
	Gear	GearLess, Gear	Motor with Gear or without gear
	Pole Pairs		Usually, motor supplier only tell you how many magnets motor has , if you know magnets count , then **Pole Pairs = magnets count / 2**
	Reduction Ratio		**--Consult your motor supplier, --you also can get correct RR value by our MOTOR TEST interface, we had introduced it**

			above at OPERATION topic
	Speed Sensor	0-36	Set 0 if motor wasn't equipped speed sensor Set 1 if motor was equipped with a speed sensor
	Temperature Sensor	Disable, Enable	**Disable** - motor was not equipped with Temperature sensor **Enable** - motor was equipped with Temperature sensor ***There have varies different type temperature sensor works with different manners, so , provide our technical data with this senor before you want use temperature measure option for motor***
	Phase Table	F132645 ,F326451, F264513,F645132,F 451326,F513264, B132645 ,B326451, B264513,B645132, B451326,B513264	Phase Table is determined by motor, usually ,different brand motor has different phase table , This is a most important settings which guide motor how to commute while motor running, ,incorrect setting will make motor more noisy or make controller broken. **Caution: You can power bike with ADJUSTABLE DC POWER SUPPLIER and limited the max current output less than 2A to try this these options , DO NOT POWER BIKE WITH BATTERY when you want to find the correct phase table for an unknow motor, otherwise will burn motor or controller** Default: F132645
Display	Enable	Disable, Enable	**Disable** - if system don't have a display, and you have to make a short switch and connected with display's connecter on controller side**(don't make this switch by yourself , maybe a short circuit will occur and broken your controller)** Default: Enable

	Level Count	3-6	The max assistance level count
	Auto Level	0,1	Set 0 if don't need a AUTO assistance level Set1 Atuo assistance level will be activated
	Level1_Speed/Power	5-40km/h / 5%-100%	Speed and power limit for each assistance level,
	Level2_Speed/Power	5-40km/h / 5%-100%	If bike was drove with Pedal sensor only , the speed limit is invalid
	Level3_Speed/Power	5-40km/h / 5%-100%	If bike was drove with throttle , both Speed and power limit is valid
	Level4_Speed/Power	5-40km/h / 5%-100%	
	Level5_Speed/Power	5-40km/h / 5%-100%	
	Level6_Speed/Power	5-40km/h / 5%-100%	
PAS Sensor	Type	Disable, Low, High, Auto	**Low, High**: some PAS sensors didn't have rotating direction detect function, only way to find the correct setting is trying; **Auto**- PAS will auto judge rotating direction while riding by itself, output Pedal signal when rotating forward and stop output when rotating backwards
	Pulse Count	4-64	The max magnet count the pedal senor have per circle
	Max Speed	60-100RPM	The max rotating speed of pedal sensor Default :60RPM
	Start Count	1-5	Sensibility value of PAS sensor , more bigger means more insensitive default :1
	Filter	1-50	Filter value of PAS sensor ,value is more bigger means more smooth and insensitive Default :2
	Keep Time	100-500ms	System will keep PAS signal with a setting period after stop pedal, it can make power output consistently while pedaling Defatul:300ms

Throttle	Enable	Disable, Enable	**Disable** : Bike was not equipped with a throttle **Enable**:Bike ike was not equipped with a throttle
	Driving Mode	0.Disvalid - 6km/h 1.Disvalid - Level Speed 2.Disvalid --Full Speed 3.6Km/h -- 6Km/h **4.6Km/h -- Level Speed** 5.6Km/h --Full Speed 6.Level Speed -- Level Speed 7.Level Speed --Full Speed 8.Full Speed --Full Speed 9.PasActivated - 6km/h 10.PasActivated - Level Speed 11.PasActivated -- Full Speed 12.Scooter Mode	The Driving mode of the throttle, For example: we select option *4. 6Km/h --Level Speed* Bike speed will be limited with *6Km/h if you stop pedal even you pull throttle fully* Bike speed will be limited with **assisting level speed (see DSIPLAY MENU ITEM) if you start pedal and pull throttle**
	Mini Voltage	500mv – 3500mv	Default:1300mv
	Max Voltage	500mv – 3500mv	Default:3300mv
Accessory	Brake Sensor	Low, High	Default: Low
	Speed Sensor	0-36	This is a setting related with extra speed sensor which was fixed on rims , Select 0 , no equipped Select 1 , equipped ***You must have to equip an extra speed sensor on rim if you use middle motor drive system***
	Shit sensor	Disable, Enable	This is an option for gear sensor , it can detect the gear changing while riding, this sensor widely used on middle motor drive system

	Torque sensor	Soft, Soft Safe , Sensitive , Sensitive Safe ,Current Mode ,Japan Mode	Some options include safe option means torque sensor have to move certain angle then start to activate power assistance, Japan mode only for Japan market
Screen	Warning Show	Disable, Enable	Enable or disable the message interface show on display
	Trip	Disable, Enable	
	Timer	Disable, Enable	
	Max Speed	Disable, Enable	
	AVG Speed	Disable, Enable	
	Bat Capacity	Disable, Enable	
	Test	Disable, Enable	
	About	Disable, Enable	
	Controller Test	Disable, Enable	
	Motor Test	Disable, Enable	
	Battery Test	Disable, Enable	
	Throttle &PAS Test	Disable, Enable	
	Accessory test	Disable, Enable	
	Temperature	Disable, Enable	
	Light Sensor	Disable, Enable	Show real time light sensor value
	Screen & Color	Disable, Enable	You can select favorite skin or font color at this interface
Default	Restore factory default settings which saved in controller memory		
Save	Save all settings before exit menu setting		
Without Save	Do not Save all settings before exit menu setting		
Firmware	--Firmware is a parameters data pack for your bike which was combined with battery settings , motor settings ,controller settings, riding feeling settings, and all other accessories settings and so on , all of these parameters related with a certain bike, one bike match one Firmware ; --Display had been built a firmware database which can store 100pcs firmware , therefore, you can manage all of your different bike's firmware easily only by one display. Its very useful for dealer or ebike builder to manage all different bikes there have --There have 2 APPs we provided at this moment, you can load one firmware to controller by APP , or you can load or download firmware database to controller --At this process , you can choice one firmware on display for your bike		

7 Warning messages

These messages will be blinking show on screen when warning event was happened , Do not try to repair by yourself if you not totally understand this manual.

WARNING COMMUNICATION INTERRUPTED ⚠	Lose communication between display and controller Solution: Check the communication cable between display and controller		
WARNING OVER CURRENT ⚠	Over Current Solution: decrease power	WARNING LOW VOLTAGE ⚠	Battery empty Solution: Recharge the battery
WARNING SPEED SENSOR BROKEN ⚠	The speed sensor is broken or lose connecting	WARNING MOTOR HALL BROKEN ⚠	Hall inside the motor was broken or lose connecting
WARNING CONTROLLER OVERTEMP ⚠	Over Temperature Solution: decrease power	WARNING MOTOR OVERTEMP ⚠	Over Temperature Solution: decrease power

8 Error messages

Don't not use bike and try to shut the battery power off if errors were happened, DO NOT TRY TO REPAIR IT BY YOURSELF , send your bike to your service station , otherwise may result in serious injury.

ERROR VERSION DISMATCH	It means communication protocol, between controller and display is different. You have to make sure the version between display and controller is same
ERROR SYNCHRO FAIL	System will auto verify the parameters which was stored in display and controller memory. system will create a synchro process, If the parameters are different Solution: check the communication cable and power on again
ERROR CONTROLLER BROKEN	It means there have a short circuit problem in the controller. user should stop using bike and power off the battery immediately
ERROR CONTROLLER MEMORY FAIL	It means the controller memory is fail Solution: change a new controller

ERROR DISPLAY MEMORY FAIL	It means the display memory is fail Solution: change a new display
ERROR GALLOP THROTLE FAIL	there have 3 possibilities if this error happened 1. User grip the throttle during on power-on period , 2. Throttle was broken
ERROR MOTOR DISCONNECTED	It means motor cable is disconnected or cable is broken

9 Changing skin and font color by display

what is skin

there have three different color skins preset in display memory, you can choice the favorite one for you own ；

| Green Skin | Blue Skin | Brown Skin |

what is Font color

There have 3 different font color solutions preset in display, choice the favorite one for you own ；

Operation

| Step1: power on	Step3: Press<power> button, until the interface appears as below, press up and down buttons, choose skin color
Step2: Press <power>button, until TEST interface appears	Step4: Press<power> button, until the interface appears as below, press up and down buttons , choose the font color.

10 Changing font colors by APP

Font Color

If you don't like the font color we preset in display , You   can redefine font color by this APP to make different font color

Preparation

➢ Plug USB Dongle into PC USB stock;(you may have to install drive software for this USB Dongle when connecting with PC first time)
➢ Connect display with USB Dongle
➢ Power on display
➢ Run APP

USB-D1
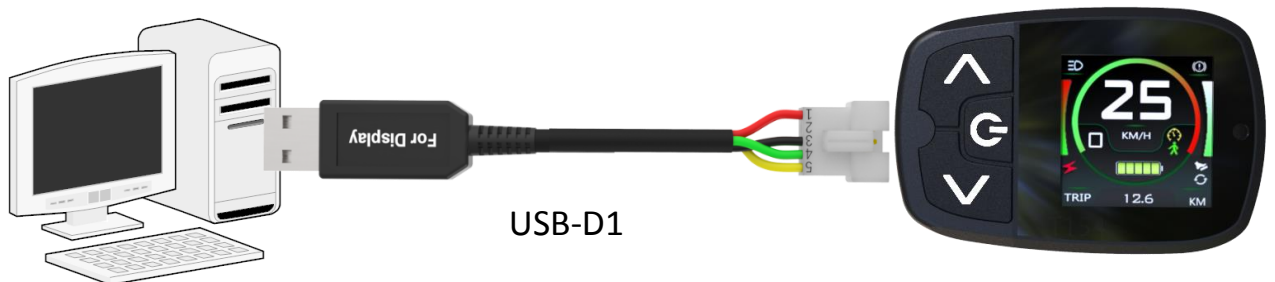
Operation

➢ Step1: Open port ,
➢ come to SYSTEM menu to reset the UART port number if can't open port properly
➢ Step2: click READ button, read the current existing color solution file if you have
➢ Step3: select the correct model for target display
➢ Step4: click the items what you want to change color show on APP
➢ Step5: click Send button after color solution set was ready

11 Load Picture to Display by APP

There have Two images will be shown on display ,when display power on or off , user can reload two images to replace it by yourself via this APP .

Preparation
- ➢ Plug USB Dongle into PC USB socket; (you may have to install drive software for this USB Dongle when connecting with PC first time,)
- ➢ Prepare pictures which you want to load , the size of the picture should be (T154-- 240*240, T24V--240*320, T24H--320*240)
- ➢ Connect display with USB Dongle
- ➢ Power on display
- ➢ Run APP

USB-D1
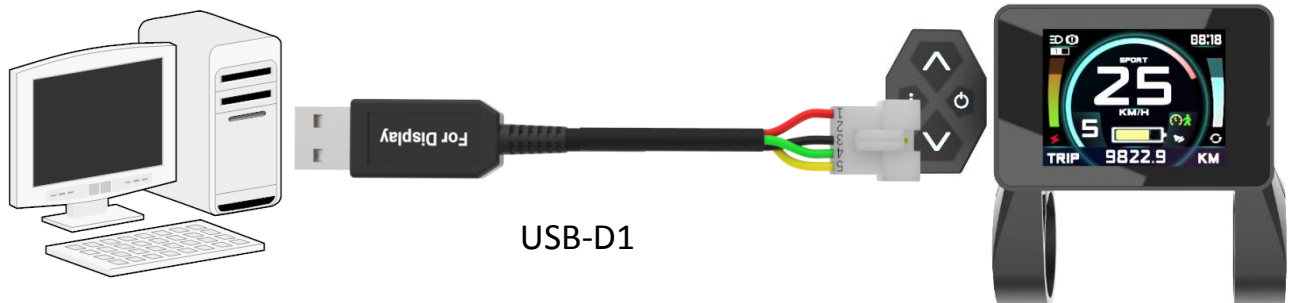
Operation
- ◆ Step1: Open port；
- ◆ Step2: Build communicating connection between APP and display
- ◆ Step3: choose the model of target display
- ◆ Step4: Read the picture
  notice: the smallest size of the picture of T154 is 240*240
        T24V : 320x240
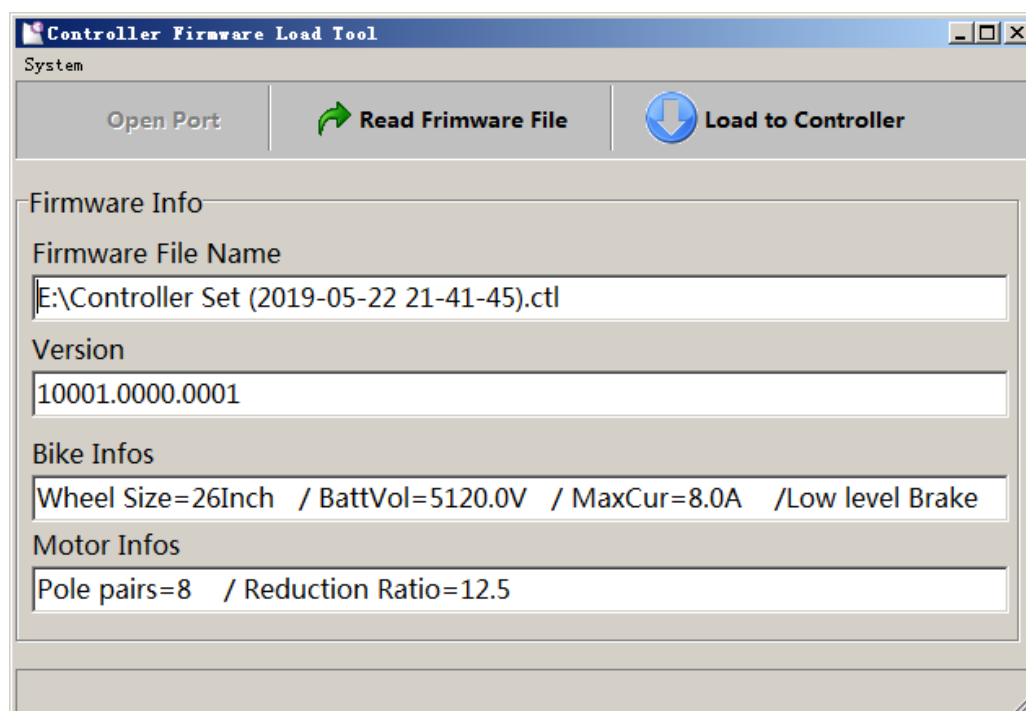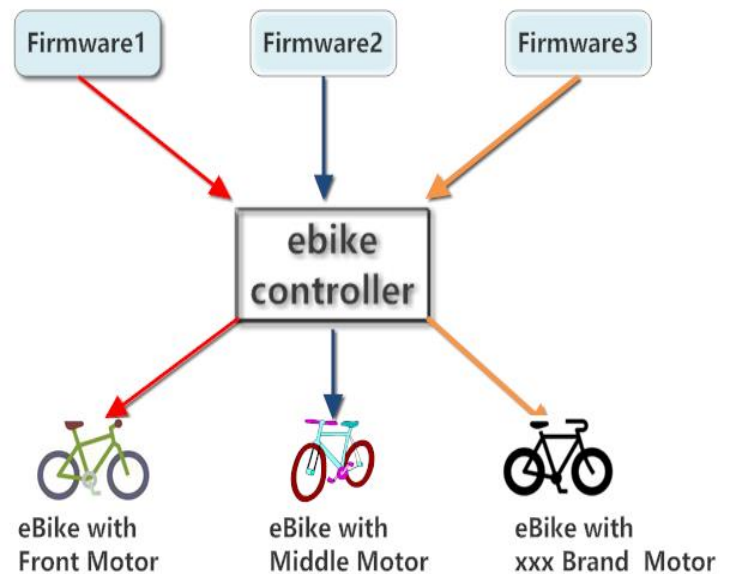   T24H : 240x320
- ◆ Step5: Load pictures as guide
- ◆

12 How to Load firmware to controller by APP

Firmware is a parameters pack which was combined with battery settings , motor settings ,controller settings, riding feeling settings, and all other accessories settings , all of these parameters related with a certain bike, this firmware was saved in controller memory ;

Preparation

➢ Plug USB Dongle into   PC USB socket;
➢ Connect Controller with USB Dongle
➢ Run app
➢ Read in a exist firmware file
➢ Load to controller

USB-C1

Controller Firmware Load Tool

System

| Open Port | Read Frimware File | Load to Controller |

Firmware Info

Firmware File Name

E:\Controller Set (2019-05-22 21-41-45).ctl

Version

10001.0000.0001

Bike Infos

Wheel Size=26Inch   / BattVol=5120.0V   / MaxCur=8.0A   /Low level Brake

Motor Infos

Pole pairs=8   / Reduction Ratio=12.5

13 Firmware database management APP

Each bike has one or more firmware for different applications. A firmware database was built in display to contains max 100pcs firmware you may have .

After you loaded firmware database into display , you can choice one for a certain bike by display operating FIRMWARE menu,(*see Menu setting topic above*) when you install this display on bike.

Usually , we can create or modify a firmware database on PC first by APP then send this database to display after ready.

Operation

➢ Plug USB Dongle into   PC USB socket;
➢ Load a database from PC
  (also you can insert OR delete firmware by this APP)
➢ Connect display with USB Dongle
➢ Power on display
➢ Run APP
➢ Click Send to display or Receive from display

14 Tools for service and maintaince

We provide some special tools for dealers for service . it will take   more convenience for dealer when they carry out after sale service or   maintaince.

1. Set service distance for a bike

Dealer can set a bike with a certain service distance, for example, set it as 100km , then , after rider rided more than 100km, display will show service information on screen to alert   user that , bike have to   back to service   station and make a maintance.

2. Reset password for a display when user forget his password

How to use these tools

➢ Prepare for A service setting display(need buy T154-S from our servicer indivually)
➢ Make a connecting cable (see below)
➢ Prepare the target display
➢ DC power supply(12V-48V)

T154-S(Service Set Display)   Target Display
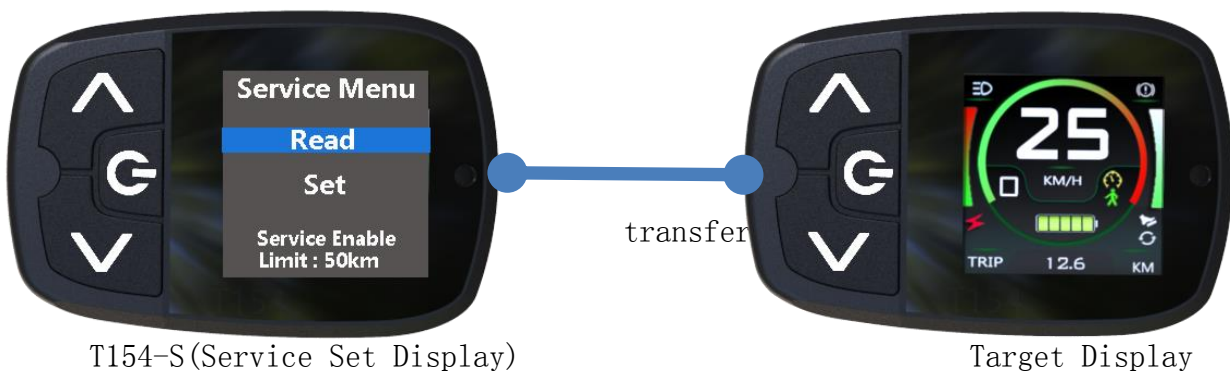
15 Display interface reference

T154-1

T154-3

T24-H1

T24-H2

T24-H3

T24-V1

T24-V2

M15