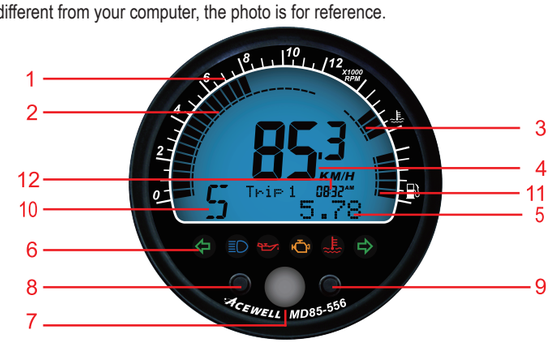
20171018

ACEWELL®

E13 10R-0413264

ATV/Motorcycle/Scooter Computer
ACE-MD085-254/354/5XX User Manual

Thanks for purchasing the Motorcycle/Scooter/ATV computer; this manual is specifically designed for ACE-MD085-25X/354/5XX series. MD085-254 has bar-speedometer up to 250Km/H, MD085-354 and MD085-5XX have12000rpm bar-tachometer. Other functions are the same. Each series includes different models, each model has same functions but with different LED indicators. You may find that the photo has a set of LED indicators different from your computer, the photo is for reference.



PANEL DESCRIPTIONS

1. Tachometer Scale
2. Bar-tachometer
3. Bar temperature gauge
4. 1st row: Speedometer
5. 2nd row: Other functions
6. LED Indicators
7. Shift warning indicator
8. RESET Button
9. MODE Button
10. Gear Indicator
11. Bar Fuel gauge
12. 12/24HR clock

Models and Indicators

Model No	LED Indicators
MD085-X52	⇦ ≡D △ 🛢 N ⇨
MD085-X54	⇦⇨ ≡D 🛢 ⛽ ⚙ N
MD085-X56	⇦ ≡D 🛢 ⚙ 🌡 ⇨
MD085-X59	⇦ ≡D (!) ⛽ 🌡 ⇨

FEATURES

- Simultaneously displays tachometer, speedometer, gear indicator, clock, fuel gauge, bar-graph temperature meter and one of the other functions.
- Integrated an USB connector for Constant voltage control charger. Main unit with Aluminum forging CNC upper ring and built-in 5-7 LED indicators for different applications.
- Built-in gear indicator which calculates gear comparing speed and RPM, and "gear indicator off" mode for Automatic vehicles.
- Built-in RGB LED backlight, user can adjust his/her prefer backlight color. On some models the backlight can be controlled separately from the ignition power.
- Bar-graph tachometer has scale of 12,000rpm, digital tachometer is up to 19,900rpm.
- End user is able to adjust odometer when the odometer is less than 30km /18.6 miles.
- Acceleration and deceleration timers as well as distance timer for racing practice.
- Built-in air temperature sensor which installed outside the housings.
- Fast processor so can connect to pulse type gearbox speed sensors.
- Universal wheel circumference setting range: 1-3999mm.
- Fuel gauge includes +/- 30～80Ω, 100Ω, 250Ω and 510Ω options for fuel sender input resistance. In reserve mode, the fuel gauge is not displayed and fuel symbol lights when the input wire is connected to -ve. The gauge can be switched off entirely if not required.
- Flexible battery warning voltage setting from 11.0 to 14.9V.
- Speedometer can show nearest 0.1 mph or km/h speed if required by user. E.g. 100 or 100.5
- Includes bracket, RPM sensing wire, speed sensor, PT1/8 temperature sensor, air temperature sensor, fitting kits and wiring harness.
- Excellent water resistance, anti-vibration structure and noise immunity design.

SPECIFICATIONS

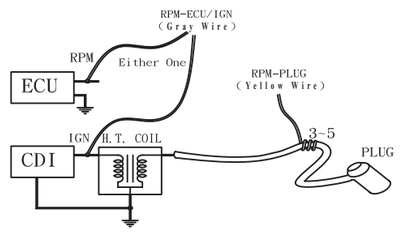
Functions	Symbol	Specifications
Bar speedometer*		250 km/h for model #254 & 25X only
Bar tachometer		12,000 rpm for model #354 & 5XX only
Digital Tachometer	RPM	100～19,900 rpm, 100rpm increment
Max. RPM	Max RPM	100～19,900 rpm, 100rpm increment
Speedometer	Km/h / MPH	2.4~300.0 km/h (187.5MPH)
Trip meter	Trip 1/2/3	0.00~999.99 KM/Miles
Odometer	Odometer	0 - 999999 KM, 0-624999 Miles
Maximum speed	MAX SPD	2.4~300.0 km/h (187.5MPH)
Average speed	AVG SPD	2.4~300.0 km/h (187.5MPH)
12/24 Hour Clock	88:88(AM/PM)	0:00'00" – 11H59'59" / 23H59'59"
Hour meter	HR Time	0 – 9999H59'
Riding timer	R.Time	0 – 99H59'59"
Total Riding Time	T.Time	0 – 9999H59'
Gear indicator		N, R, 1, 2,...8 or off
Bar-Fuel Gauge		1-5 bars, +/- 30～80Ω, 100Ω, 250Ω, 510Ω, off mode or RES mode.
Volt meter	VOLT	8-18VDC, battery voltage warning settable
Engine Temperature	TEMP1	0℃～180℃ / 32°F～356°F, off or Hi modes.
Air Temperature	TEMP2	-20℃～60℃ / -4°F～140°F
MAX Temperature 1/2	MAXTEMP1/2	0℃～180℃ / 32°F～356°F
Bar Temperature		1-5 bars or Off mode.
Distance Timer	DstTimer	0 to 1/4 mile. 0 to100Meter, 0 to 400Meter
Acceleration Timer	AccTimer	0 to 100km/h, 50 to 70mph
Deceleration timer	DstTimer	100km/h to 0km/h
Maintenance reminder	Maintain	0～9999H / 0～9999Km or Miles adjustable

Power Input	DC 8-18V
Speed Sensor	Reed, 2 or 3 wires Hall-effect Sensor
Tachometer input	CDI or Ignition Coil Signal or ECU
Wheel circumference setting	1mm-3999mm (1mm increment)
Temperature sensor	PT1/8" thermistor sensor
Air Temperature sensor	Air thermistor sensor
Dimensions	Ø85*56.1mm

INSTALLATION & PARTS

RPM sensor mounting: RPM Input, Either one

1. Signal intensity from ignition coil is dependent on vehicle type.
2. Coil 2-5 turns around spark plug lead, with more turns creating steadily stronger signal, fewer turns creating weaker signal.
3. The RPM circuit is designed for most bikes, however some bikes' signal is too strong if the RPM looks like much more than actual RPM and unstable, please connect the included 1M Ohm resistor in series to solve it.

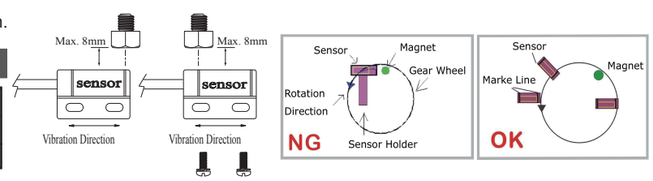


SPEED SENSOR Mounting:

ACEWELL has several speed sensors; the unit may include one of them. If the model is intended to be connected to a gearbox electronic speed output to obtain the speed reading, no speed sensor will be included.

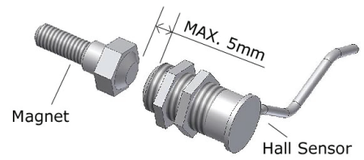
Reed Speed Sensor and Magnet:

1. This sensor is universal sensor for motorcycle, find a rotating part to install magnet (for example disk, sprocket or driveshaft) and a location to install the sensor where it can be aligned to the magnet.
2. Align the center of the magnet to either of the sensor marking lines or the side of the sensor. The magnet must not travel down the body of the sensor
3. Installing the sensor parallel to the vibration direction creates optional anti-vibration effect.
4. Make sure the gap between the magnet and the sensor is within 8mm.



Hall Effective Speed Sensor and Magnet:

1. This is universal sensor for ATV front or rear wheel installation or motorcycle front wheel installation. For some fitments an accessory speed sensor holder may need to be purchased.
2. Find a rotating part to install magnet (for example disk, sprocket or driveshaft) and a location to install the sensor where it can be aligned to the magnet
3. Align the center of the magnet to center of side face of the sensor.
4. Make sure the gap between the magnet and the sensor is within 5m



Specific Hall sensors:

Cable drive adaptors for most bikes originally fitted with cable driven speedometers or milemeters are available. When using these cables it is necessary to divide the circumference setting by the number of rotations of the cable per rotation of the wheel.

Thermo Sensor and Sensor Tube:

1. The unit includes a water temperature sensor; you have to purchase a suitable water pipe temperature sensor tube to install the sensor easily.
2. Cut the water pipe, insert the temperature tube into the pipe and secure it by attached pipe clamps.
3. Screw the sensor into the tube.
4. If your vehicle is fitted with a thermostat that stops water flowing to the radiator when the engine is cold, you will not get a reading until the thermostat opens

Air Temperature sensor:

1. MD085-5XX series includes an air temperature for outdoor temperature measurement.
2. Plug the sensor's connector to the relative connector from main

FUNCTIONS

: Bar-Graphic Tachometer

The bar tachometer is 12,000rpm.

Km/H or MPH: Speedometer

1. Displays speed meter up to 300 Km/H or 187.5 MPH.
2. Speedometer can show nearest 0.1 mph or km/h speed if required by user. E.g. 99 or 99.9
3. The maximum frequency of software divider is 7K Hz.
4. The speed can be less than 399.9 KM/H in case the setup is using software divider for speedometer, for example the maximum speed is 250KM/H in case setup of software at 105P and the wheel circumference at 1277mm.

RPM: Digital Tachometer

1. It displays digital tachometer up to 19,990RPM and displays 19,999rpm when tachometer is over 20,000rpm..
2. Tachometer signal can pick up from either CDI or Ignition Coil Signal.

Shift Warning RPM

1. The function enables you to set up a shift warning RPM.
2. Shift warning LED indicator flashes when RPM reaches setting value, and stops flashing after you shift gear.

MAX RPM: Maximum Tachometer

Displays highest tachometer achieved since last Reset operation.

MAX SPD: Maximum Speed Meter

Displays highest speed achieved since last Reset operation.

AVG SPD: Average Speed Meter

It calculates average speed from last RESET. The AVG is calculated from TRIP 1 be divided by RT.

TRIP 1/2: Trip Meter 1 or 2

Trip 1 or Trip 2 function accumulates distance travelled since last RESET.

TRIP 3: Trip Meter 3

1. TRIP-3 function appears and starts to accumulate trip distance meanwhile flashes the last fuel bar automatically at low fuel warning status.
2. The LCD screen will auto change to the Trip 3 screen after 4 seconds of button operations at low fuel warning status.
3. TRIP-3 be reset to zero automatically when fuel is added to over the low fuel warning level.

Odometer:

1. Odometer accumulates total distance traveled.
2. Odometer data is adjustable when it is less than 30km (18.6 Miles), after that it stored in memory and cannot be reset.

R. Time: Riding Timer

1. Calculates total running time since last RESET.
2. Counter automatically begins with movement.

T. Time: Total Riding Timer

1. Calculates total riding time fr om the beginning of the bike.
2. TT data is stored in memory, and couldn't be reset.

HR Time: Total Hour Meter

1. Calculates total engine operation time since installation.
2. Count automatically begins with engine starting.
3. HR Time data is stored in memory, and couldn't be reset.

: 12/24 hour Clock

It displays 12 or 24 hour current time.

TEMP1: Digital Engine Temperature Meter

1. It displays -L-℃ or -L-℉ when temperature is lower than 40℃ or 104℉, and displays -H- ℃ or –H-℉ when temperature is over 180℃ or 356℉.
2. The LCD screen jumps to TEMP 1 screen automatically, flashes temperature bar and -H- as well backlight color when the thermo sensor detects temperature higher than the maximum preset temperature.
3. The LCD screen will auto change to the TEMP 1 screen and flashes bar-temperature and -H- after 4 seconds of button operations at over temperature status. Backlight always flashes at over temperature status.
4. Stop engine until temperature cooling down to protect your engine.

TEMP 2: Air Temperature

It displays air temperature from -20℃(-4℉) to+60℃(+140℉)

MAXTEMP1/2: Maximum Temperature 1/2*

Displays highest temperature achieved since last Reset operation.

Maintain: Maintenance Reminders

1. It counts down the preset Maintain entered time or distance since last RESET.
2. It accumulates Maintain when the count down reaches to "0", and symbol of "Maintain" flash to remind you to maintain oil or parts.
3. Push and hold RESET button to reset and restart the maintenance reminder after maintained.

VOLT: Digital Voltage Gauge

It checks bike's battery and charging systems health.

: Gear Indicator

1. The gear indicator has each one wire for N and R, connect wires to N and R gears firstly.
2. The gear indicator calculates gear comparing speed and RPM then displays gear position.
3. User has to training the gear indicator before use it.

:Bar Thermometer*

1. Have 5 bars to indicate engine temperature.
2. The 3rd bar counts from bottom be turned on and over temperature LED flashes when thermometer reaches the preset warning temperature, each +/-15℃ lights on/off a bar base on the 4th bar.
3. The bar-temperature flashes when the measured temperature is higher than the preset warning temperature.

:Fuel Gauge

1. Has 5 bars to indicate how much fuel remains.
2. To use as a fuel gauge, it built-in F10 E250, F10 E510, F30 E80, F100E10,F250E10, F510E10,F80 E30 OFF Ohm fuel sender resistance, FXXX means full fuel resistance, EXXX means empty fuel resistance, the fuel bars will disappear when you select "OFF" mode. Last bar flashes to indicate low fuel level automatically. F30 E80 and F80 E30 are for vehicle application.
3. To use as a reserve indicator, connect the reserve switch to the input and put into "RES" mode. When the switch pulls the input to –ve the backlight will flash different color and the last fuel-bar flash. On vehicles with temperature based sensors a 68 ohm 5w resistor needs to be connected between the input wire and 12v (switched)

4.If the gauge is not required they can be switched off

DstTimer: Distance Test Timer

1. The DstTimer can be set 100meter or 400meter.
2. The unit calculates trip timer auto- start when receive speed signal and auto-stop when the bike/vehicle reaches the preset distance.

AccTimer: Acceleration Timer Test

1. The AccTimer can be set 0-100Km/H acceleration test.
2. The unit calculates acceleration timer auto- start when receive speed signal and auto- stop when the bike/vehicle reaches the preset speed.

DecTimer: Deceleration Timer Test

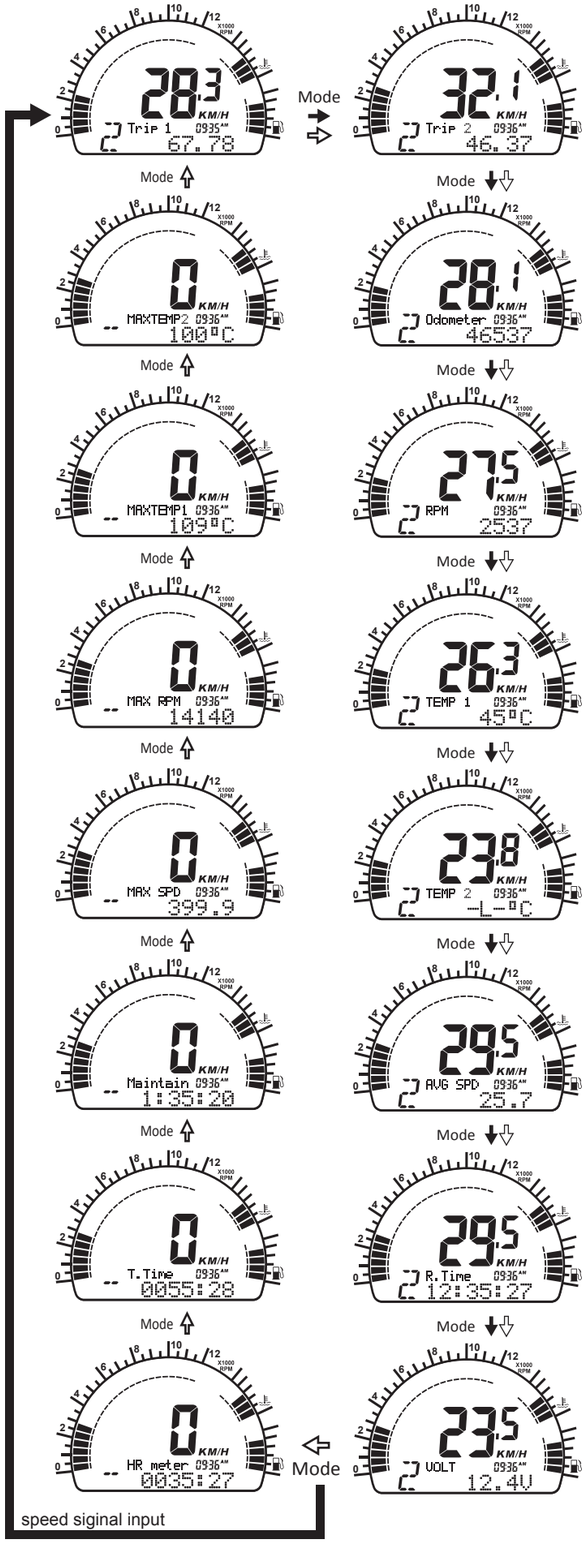
1. The DecTimer can be set 100 to 0Km/H deceleration test.
2. The unit calculates deceleration timer auto- start when speed decelerates to 100km/h and auto- stop after 2 seconds of the bike/vehicle stop then returns the over counted 2 seconds automatically..

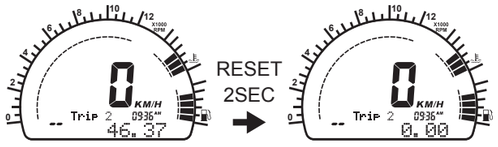
BUTTON OPERATIONS

MODE Button

1.Press the MODE button to move between all functions in sequence as " ⇨ " from one function screen to another when the speed sensor does not detect any signal input.

2.Press the MODE button to move partial functions in loop sequence as " ➔ " when speed sensor detects signal input.





Shift Warning RPM Operation

1. Press MODE button to the RPM screen; pull on the throttle until the desired shift warning RPM.
2. Press RESET button to confirm and set up the shift warning RPM.
3. Bar-graphic tachometer and warning LED will flash to warning you shift gear.
4. Press RESET button for 2 seconds at the RPM screen to re-adjust the shift warning RPM

Backlight Color Adjust:

1. Press MODE button to get to the VOLT screen when not moving; push and hold RESET button for 2 seconds to go into backlight color setting mode.
2. It displays “LED RGB and RX-GX-BX”, the X after R, G and B indicate each color of Red, Green or Blue color to be adjustable, each color has 10 levels 0, 1, 2,.9 for setting, “0” means the color is off, “9” means the color is turned on 100%.
3. Each press of the RESET button increments the flashing digit by 1, press MODE button to confirm the flashing digit setting and jump to next digit to be set. Press MODE button for 2 seconds to finish the setting and go to normal mode Trip 1.

Gear Indicator training operations:

1. Connects grey wire to N and purple wire to R..
2. Put bike to a rolling stand, turns on engine and keep at N gear.
3. Gear indicator shows “N”
4. Change the LCD screen to digital RPM.
5. Press and hold MODE button for 2 seconds to go into the number of gears setting mode.
6. Gear indicator flashes the default 6 gears.
7. Press RESET button to select the number of gear, user can select 4-8 gears or “0” to disable the gear function.
8. Press MODE button to confirm the number of gears and go to the number gear ratio setting mode.
9. It displays and flashes “1”, shift bike’s gear to the 1st gear, run the engine to between 2000-4000RPM.
10. Hold the speed and the RPM for about 5 seconds until the “-“flashing. The flashing “-“ after the gear “1” means the 1st gear be set.
11. Press MODE button to confirm the set and go to the 2nd gear setting.
12. It displays and flashes “2”, shift bike’s gear to the 2nd gear, run the engine to between 2000-4000RPM.
13. Hold the speed and the RPM for about 5 seconds until the “-“flashing. The flashing “-“ after the gear “2” means the 2nd gear be set.
14. Press MODE button to confirm the setting and go to next gear setting.
15. Operates the same operations as items 11-14 to set other gears until the last gear be set. Press MODE button to return to normal mode.
16. At gear indicator setting mode, press and hold MODE button for 2 seconds to abort the setting if you need to re-set at any setting screen.

Distance timer, acceleration and deceleration timers setting mode

1. Press MODE or RESET button to the T. Time screen at parking status, press and hold RESET button for 2 seconds to go into the 3 test timers select mode.
2. It displays SELECt and flashes DstTimer, press MODE button to move DstTimer, AccTimer, DecTimer from one set mode to another set mode in loop sequence, press and hold MODE button for 2 seconds at the one of the 3 select modes to go into the testing mode.
3. At any testing mode, each press of MODE button converts items to be tested or no function in case it has only item, press and hold MODE button for 2 seconds to confirm and enter the item to be tested, the timer counts automatically when it receive speed and auto-stop when finishes the timer. Each press RESET button to return to last operated mode until the select mode. Press and hold the RESET button for 2 seconds at any testing mode to jump to normal mode Trip 1 screen.
4. At Distance Timer testing mode, it displays DstTimer and flashing “100M”, each press of MODE button converts 100M or 400M to be tested, press and hold MODE button for 2 seconds to confirm the setting and go into the DstTimer testing screen and flashing 00:00:00, the timer counts automatically when it receive speed signal and auto-stop when trip meter reaches preset 100 or 400 meter. Press MODE button to reset the tested timer to zero and preparing another new round test, it displays DstTimer and flashes 00:00:00 again. Press and hold MODE button for 2 seconds to go out the TRIP RT test screen and return to Trip 1 screen.
5. At Acceleration test mode, it displays AccTimer and flashing “0-100”. Follow the item 3 of button operation to finish the acceleration test or have another test or jump to normal mode Trip1.
6. At deceleration test mode, it displays DecTimer and flashing “100-0”, Follow the item 3 of button operation to finish the acceleration test or have another test or

RESET Button

1. Press RESET button acts as a revised button operation of MODE button.
2. Press MODE or RESET button to the desired screen then press RESET button for 2 seconds to reset TRIP 2, MAX SPD, MAX RPM and MAX TEMP1 or 2 data from stored values to zero individually. The maintain reminder data will be reset to the preset value rather than zero.
3. The data of Trip 1, AVG SPD & R. Time will all be reset at the same time when one of the 3 data functions is being reset.
4. ODO, clock, HR Time and T. Time data cannot be reset.

WHEEL CIRCUMFERENCE TABLE

1. The details below have been calculated using following formula: Tire Diameter (inches) x 25.4(mm/inches) x 3.1416 = wheel circumference (in mm).
2. Identify the tire size of your ATV/Motorcycle when you need to change different tire size and key in the corresponding number shown in the following chart.

Tire outside diameter	Circumference number (mm)	Tire outside diameter	Circumference number (mm)	Tire outside diameter	Circumference number (mm)
15 inch	1197	19 inch	1516	23 inch	1835
16 inch	1277	20 inch	1596	24 inch	1915
17 inch	1357	21 inch	1676	25 inch	1995
18 inch	1436	22 inch	1756	26 inch	2075

3. These values are approximate and will differ for different brands of tire, we would always recommend that you measure the distance travelled per revolution of the wheel in mm and enter this into the computer.
4. The computer calculates the wheel rotating length between 2 passes of the magnet; use this table to find the settings when you are using a reed sensor or an universal hall sensor with magnet to measure your speed.
5. If you are using a cable drive speed sensor then divide the number in the above table by the number of turns of the cable drive for each revolution of the wheel. For example if 1 wheel revolution equals 5 turns of speed cable then the wheel circumference has to be divided 5.
6. You can use more magnets, but the wheel circumference setting must be divided by the number of magnet you installed.
7. The computer has a built-in software divider setting from 1 to 199 for different speed signal application, refer to the divider setup, one means one wheel revolution creates one signal. You have to input the number of signal per wheel revolution to have a correct speed.

Clock, RPM, Wheel, Divider, Unit, Maintain, Thermometer, fuel meter and ODO SET UP

1. Setup operations include clock set, RPM shift warning, numbers of engine rotation per signal, speed sensor type, wheel circumference, pulse set for signal divider, units, decimal, maintain reminder, warning voltage, units of temperature 1, temperature 1 warning, units of temperature 2, temperature 2 warning, fuel meter input resistance selection and odometer adjustment. These must be set up step by step. The computer will automatically return to normal mode if no button is pressed within 75 seconds.
2. Press both MODE & RESET buttons to go into setting mode. In setting mode, each press of the RESET button increments the flashing digit by 1 or converts units. Press MODE button to confirm the digit setting and warning jump to next digit or next setting screen to be set. Press MODE button for 2 seconds at any setting screen to finish the setting and go to normal mode.
3. It displays "CLOCKset, XX:XX and flash 12H or 24H" symbols as well AM/PM after XX:XX in case you select 12H. Operate buttons as shown in section 2 to set the clock and jump to shift RPM warning setting.
4. It displays the default "RPMset and 06500", the digit “06” flash. Using mode and reset buttons set the RPM shift warning and jump to engine specification setting.
5. It displays "RPM_NUM 1r1P", the default value is 1r1P; there are 5 options: 1r1P, 2r1P, 3r1P, 1r2P, 1r4P. “r” means the numbers of engine rotation, “P” means number of signals from engine or coil. For example the value 2r1P means the engine rotate 2 turns for one pulse generated.
6. Press the RESET button to loop through each of the 5 options. Press MODE button to confirm the choice one and go to speed sensor type setting screen.
7. It displays “SPD_TYPE and flash HALL or REED”. Using mode and reset buttons set speed sensor and jump to wheel circumference setting.
8. It displays "WHEELset and XXXX" the 1st X is flashing, flashing digit is digit to be set. Using mode and reset buttons set the wheel circumference and jump to signal divider setting.
9. It displays "PULSEset and 001" for signals to be divided. Using mode and reset buttons set the correct value for the installation and jump to unit setting. Using mode and reset buttons set the correct value for the installation.
10. It displays “UNIT SET and flash KM/H or MPH”. Using mode and reset buttons set the correct value for the installation the unit setting and jump to decimal point setting.
11. It displays “DECIMAL 99.9Km/H and flash ON” or “DECIMAL 99Km/H and flash OFF”, the decimal point will be disappeared in case Off is selected. Using mode and reset buttons set the decimal and jump to maintain reminder setting.
12. It displays “FIX MODE and flash HR. OFF or DST”, HR is setting by hour meter and DST is setting by trip meter as the maintain reminder. Using mode and reset buttons set the maintain reminder and jump to voltage warning setting. The maintain reminder function will be disappear when select “OFF”.
13. There are 3 voltage warning value VOLT_ON, VOLT_OFF and VOLT_HI to be set in the order.
14. It displays “VOLT_ON and a flashing numbers XX.X of voltage” to be set, “VOLT_ON” means battery warning on voltage – when the voltage falls below this the LED will come on, setting range from 11.0 to 14.9V. “VOLT_OFF” means battery warning off voltage, setting range from 11.0 to 14.9V to, but VOLT_OFF voltage must larger than VOLT_ON voltage– when this voltage is exceeded the LED will go off.. “VOLT-HI” means battery warning on voltage – when the voltage is exceeded the LED will come on, setting range from 11.0 to 15.0V“. Using mode and reset buttons set the voltage warning and jump to thermometer 1 unit setting.
15. It displays "T1_UNIT and flash ºC, ºF, OFF or HI", each press of RESET button converts ºC, ºF, OFF or HI, the temperature bars will disappear when you select oFF mode, the “T1_UNIT HI” mode is for other NTC ON/OFF sensors to show over temperature warning, digital temperature meter will be disable, NTC sensor sends a low signal to ground, backlight and last bar of bar-temperature be flash to show over temperature warning at this mode; press MODE button to confirm temperature setting and jump to temperature 1 warning setting.
16. It displays "T1_WARN and XXX" and the selected unit. Using mode and reset buttons set the temperature warning and go to thermometer 2 UNIT setting.
17. thermometer 2 setting It displays "T2_UNIT and flash ºC,ºFor OFF", each press of RESET button converts ºC,ºF or OFF, the T2 will disappear when you select OFF mode; press MODE button to confirm temperature setting and jump to fuelsensor resistance setting.
18. It displays “FUEL_SET and flash F10 E100”, there are options of F10 E250, F10 E510, F30 E80, F100E10,F250E10, F510E10,F80 E30, RES and OFF, Using mode and reset buttons set a resistance same as your fuel sender and jump to odometer setting. The fuel meter bar will disappear if you select oFF mode. In “RES” mode connecting the input wire to 0v can bring on the fuel symbol and/or LED indicator instantly.
19. It displays “ODOset, KM/H or MPH and 00000X”, the “X” is from odometer testing in factory, follow item 2 to setting a desired odometer and jump to clock setting or return to Normal Mode. This setting screen will disappear when the odometer is over 30km (18.6Miles) or your setting is over 30km.