

ACEWELL[®] ATV/Motorcycle/Scooter Computer

ACE-6XXX User Manual

Thanks for purchasing the ATV/Motorcycle/scooter computer; this manual is specifically designed for ACE-6XXX-XX series. Different series have different needle tachometer scales, each series has different models, each model has different LED indicators. You may find that the photo has a set of LED indicators different from your computer, the photo is for reference only.

Different series with different needle tachometer scales are as follows:

ACE-64XX: 9,000rpm

ACE-65XX: 12,000rpm

ACE-66XX: 15,000rpm

ACE-67XX: 20,000rpm



PANEL DESCRIPTIONS

- | | |
|-----------------------------|--------------------------------|
| 1. Tachometer Scale | 6. RESET Button |
| 2. Needle Tachometer | 7. MODE Button |
| 3. 1st row: Speedometer | 8. RPM Shift Warning Indicator |
| 4. 2nd row: Other functions | 9. Bar Temperature gauge |
| 5. Gear Indicator | 10. Bar Fuel gauge |
| | 11. 8 LED indicators |

Different models have different LED indicators, each indicator symbol means as below:

	Left direction indicator/Green		Engine oil / Red
	Main-beam headlamp/Blue	N	Neutral Gear /Green
	Right direction indicator/Green	R	Reverse Gear /Red
	Hazard Warning / Red	D	Drive Gear /Green
P	Parking/Green		Engine coolant temperature/ Red
	Direction indicator/Green		Rear fog lamp/Amber
	Flash Trailer/Green		Engine in out of use/ Red

FEATURES

- Needle tachometer, integrated digital functions and 6-10 LED indicators for different models.
- Displays needle tachometer, speedometer, bar temperature and fuel gauges, gear indicator and one other function simultaneously.
- Features a 99 lap timer and an optional cable connected remote control switch.
- Gear indicator which calculates gear by comparing speed and RPM.
- An optional air temperature sensor can measure outside temperature.
- Fuel gauge full and empty resistances are fully adjustable and it can connect to sender units with resistance range up to 990 ohms. 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 15.0V.
- Speedometer can show nearest 1 or 0.1 mph or km/h speed if required by user. E.g. 100 or 100.5.
- Highly visible 12mm shift warning LED indicator.
- Allows end user to adjust odometer when the odometer is less than 30km / 18.6 miles.
- Universal wheel circumference setting range from 1 to 3999mm.
- Includes bracket, RPM sensing wire, hall or reed speed sensor, fitting kits, wiring harness and temperature sensor.
- Excellent water resistant, anti vibration structure and noise immunity design.

SPECIFICATIONS

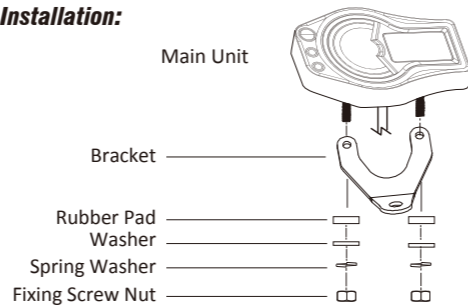
Functions	Symbol	Specifications
Needle Tachometer		ACE-64XX 9,000rpm ACE-65XX 12,000rpm ACE-66XX 15,000rpm ACE-67XX 20,000rpm

Digital Tachometer	RPM	10-19,990 rpm,
Speedometer	Km/h / MPH	2.4-399.9 km/h (248.5 MPH),
Maximum speed	MAX SPD	2.4-399.9 Km/h (248.5 MPH),
Average speed	AVG SPD	2.4-399.9 Km/h (248.5 MPH),
Temperature 1		0°C-180 °C /32°F-356°F
Temperature 2		0°C-180 °C /32°F-356°F
Max. Temperature		0°C-180 °C /32°F-356°F <0°C display -L-, >180 °C display -H-
Trip meter 1&2	Trip 1&2	0.0-999.9 KM /624.9Miles
Odometer	ODO	0 - 999999 KM, 0-624999 Miles
12/24 Hour Clock		AM/PM 0:00' - 11H59' / 23H59'
Riding timer	RT	0-99H59' 59"
Total Riding Time	TT	0-999999H
Total Hour meter	HRTT	0-999999H
Voltage Gauge	V	8.0-18.0 Volt and battery warnings
Gear indicator	N	N, R, 1, 2,...8 gears and off mode
Maintain reminder		9999km, 9999 hours or off
Bar-Temperature		1-7 Bar-graphic or off mode
Bar-Fuel Gauge		Adjustable 10Ω-990Ω, reserve mode, or not displayed
LAP	LAP	99 laps

Power Input	DC 12V
Tachometer Sensor	CDI or Ignition Coil Signal
Speed Sensor	Reed or hall Sensor
Temperature Sensor	Thermo Sensor
Speed input divider setup	1-199 Pulses
Maximum speed input frequency	7K Hz
Wheel circumference setting	1mm-3999mm
Dimensions	130.6mm x83.4mmx31.3mm

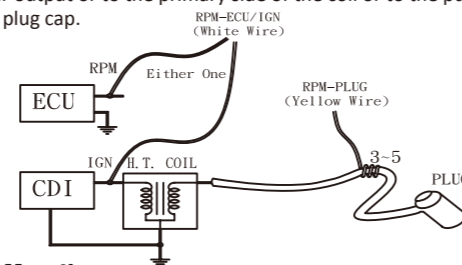
INSTALLATION & PARTS

Main Unit Installation:



RPM sensor mounting:

- Connect either the yellow or white wire to sense the RPM signal.
- The yellow wire can be wrapped around the spark plug lead.
 - Signal strength from the ignition coil is dependent on coil type.
 - Coil 2-5 turns around spark plug lead, the more turns the stronger the signal. A weak signal will not show a reading on the screen whereas a very strong signal will have a reading which is too high or very jittery. If the reading is incorrect then try putting the 1MΩ resistor which is included in the box inline in the sensor wire.
- If the signal is still unstable, please try to connect the white wire to either the ECU rev counter output or to the primary side of the coil or to the pulse wire on an active spark plug cap.

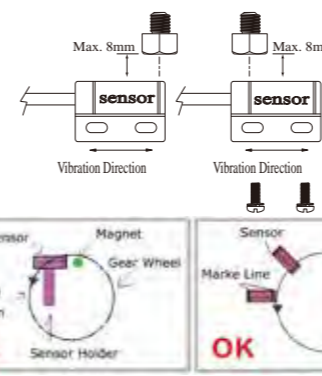


Speed Sensor Mounting:

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:

- 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.
- 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.
- Installing the sensor parallel to the vibration direction creates optional anti-vibration effect.
- Make sure the gap between the magnet and the sensor is within 8mm.



Hall Effective Speed Sensor and Magnet:

- This is universal sensor for ATV or motorcycle front or rear wheel installation or motorcycle front wheel installation. For some fits an accessory speed sensor holder may need to be purchased.
- 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
- Align the center of the magnet to center of side face of the sensor.
- Make sure the gap between the magnet and the sensor is within 5mm.



Specific Hall sensors:

Cable drive adaptors for most bikes originally fitted with cable driven speedometers or odometers 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:

- The unit includes a water temperature sensor; you may have to purchase a suitable water pipe temperature sensor tube to install the sensor on some bikes.
- Cut the water pipe, insert the temperature tube into the pipe and secure it by attached pipe clamps.
- Screw the sensor into the tube.
- 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.
- Custom sensors are available for carburetted bikes to replace the original sensor.

Wire Remote Control Switch Installation:

- Install the switch arm on handlebar.
- Install the switch box to one of 3 fixing holes and adjust switch box to a suitable angle.
- Plug the switch box connector into the main unit matching connector.

FUNCTIONS

RPM: Digital Tachometer

- It displays digital tachometer up to 19,990RPM and displays 19,999 rpm when tachometer is over 20,000rpm..
- It has 2 wires to pick up RPM signal, the yellow wire is to connect to Plug, and white wire is for signal from ECU or Ignition coil.

Shift Warning RPM

- The function enables you to set up a shift warning RPM.
- A indicator flashes when RPM reaches 500rpm before setting value.
- Shift warning LED indicator flashes when RPM reaches setting value, and stops flashing after you shift gear.

Km/H or MPH: Speedometer

- Displays speed meter up to 399.9 Km/H or 248.5 MPH.
- The maximum frequency of software divider is 7K Hz.
- With a small wheel size and large number of pulses per wheel revolution it may not be possible to display very high speeds.

MAX: Maximum Speed Meter

Displays highest speed achieved since last Reset operation

AVG: Average Speed Meter

It calculates average speed from last RESET. The AVG is calculated from TRIP1 be divided by RT.

TRIP 1&2: Trip Meter 1&2

TRIP function accumulates trip distance since last RESET as long as bike/vehicle is moving.

ODO: Odometer

- ODO accumulates total distance traveled.
- ODO datemory and cannot be reset.

RT: Riding Timer

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

TT: Total Riding Timer

- Calculates total riding time from the beginning of the bike.
- TT data is stored in memory, and cannot be reset.

HRTT: Hour Meter

- Calculates total engine operation time since installation RESET.
- Count automatically begins with engine starting.
- HRTT data is stored in memory, and cannot be reset.

: 12/24 hour Clock

It displays 12 or 24 hour current time.

TEMP 1 and 2: Temperature Meter 1 & 2

- It measures and displays from 0°C-180°C / 32°F-356°F.
- It displays -L-°C or -L-°F when temperature is lower than 0°C(32°F) or disconnected temperature sensor, and displays -H- °C or -H-°F when temperature is over 180°C or 356°F.
- User can measure engine temperature with sensor 1 and ambient air temperature with sensor 2.
- The bar-temperature and digits of temperature as well temperature LED indicator flash when the thermo sensor detects temperature higher than the maximum preset temperature.

MAX TEMP 1&2: Maximum Temperature 1 & 2

Displays highest temperature achieved since last Reset operation.

: Digital Voltage and Battery Warnings

- It checks bike's battery and charging systems health.
- It has 3 modes to be set, b-on, b-off and b-HI, all 3 modes range is from 11.0V to 15.0V.
- The "b-on" means battery warning on voltage, when the voltage falls below this the LED will flash.
- The "b-off" means battery warning off voltage, b-off voltage must larger than b-on voltage.
- The "b-HI" means battery high voltage, it comes on to warn that the batter has over charging.

N : Gear Indicator

- The gear indicator calculates gear by comparing speed and RPM then displays gear position.
- User has to train the gear indicator before use it.

SCAN: Scan function

- The 2nd row of LCD data will be changed automatically every preset number of seconds if the SCAN is selected. The scan period is from 1 to 20 seconds.
- All functions will be manual operations when SCAN is switched off.

: Fuel Gauge

- Has 7 bars to indicate how much fuel remains.
- To use as a fuel gauge, the user enters the sender 'empty' resistance between 10 and 990 ohms and the sender 'full' resistance between 10 and 990 ohms. The computer produces a linear scale of bars between these two resistances. When less than 10% fuel remains the gauge will flash and the warning LED if fitted will light.
- 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 LED warning will light. On vehicles with temperature based sensors a 68Ω 5W resistor needs to be connected between the input wire and 12v (switched).
- If the gauge and warning lamp are not required they can be switched off

: Bar Thermometer*

- Have 7 bars to indicate engine temperature.
- The 4th bar counts from bottom be turned on and over temperature LED flashes when thermometer reaches the preset warning temperature, each +/-15°C lights on/off a bar base on the 4th bar.
- The bar-temperature flashes when the measured temperature is higher than the preset warning temperature.

LAP : Lap Timer

- It can keep up to 99 sets of lap timer of each circle.
- The function must be operated by an additional wiring remote control switch or an accessory IR receiver/transmitter or a magnetic field sensor.

Freezing Time for Lap timer:

- The freezing time is designed to avoid additional count signal during the set time.
- The set range is from 1 to 20 seconds.

Speed decimal option:

- User can decide to display speed to 1 or 0.1 mph / km/h.
- Follow the item 11 of set up mode to option the decimal of speedometer.

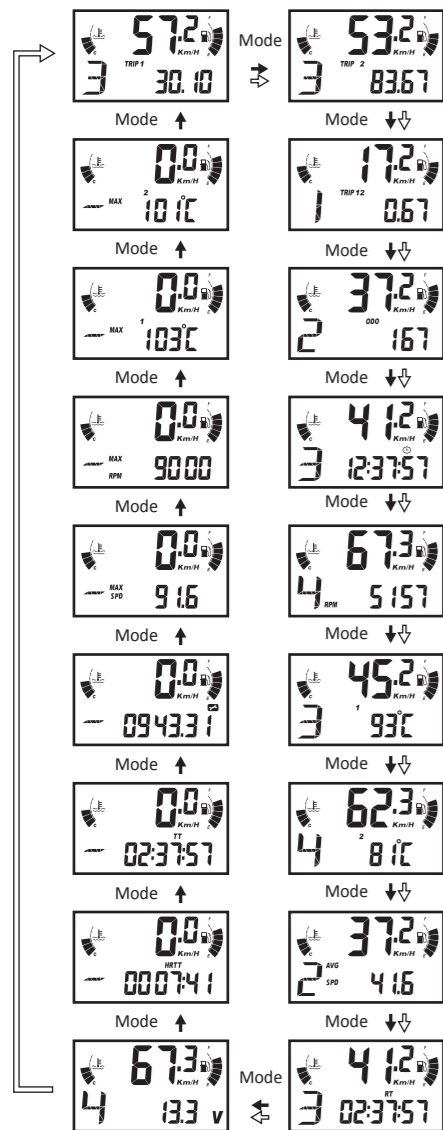
: Maintenance Reminder

- The maintenance reminder can set by either trip meter or hour meter, and an "Off" mode to switch it off.
- The trip meter maintenance can be set up to 9999km.
- The HRT maintenance reminder can be set up to 9999 hours.

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.



4. Gear indicator flashes the default 0 gears.
5. Press RESET button to select the number of gear, user can select 4-8 gears or "0" to disable the gear function.
6. Press MODE button to confirm the number of gears and go to the number gear ratio setting mode.
7. It displays and flashes "1", shift bike's gear to the 1st gear, run the engine to between 2000-4000RPM.
8. 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.
9. Press MODE button to confirm the set and go to the 2nd gear setting.
10. It displays and flashes "2", shift bike's gear to the 2nd gear, run the engine to between 2000-4000RPM.
11. Hold the speed and the RPM for about 5 seconds until the "-"flashes. The flashing "-"after the gear "2" means the 2nd gear is set.
12. Press MODE button to confirm the setting and go to next gear setting.
13. Repeat the same operations as items 11-14 to set other gears until the last gear is set. Press MODE button to return to normal mode.
14. 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.

Optional Remote Control Switch for LAP timer

1. The remote control switch has 2 buttons: MODE and LAP. The MODE button has the same function as on the main unit.
2. Press and hold the LAP button for 2 seconds to go into the LAP mode.
3. LAP Record operations:
 - a. In LAP mode, press LAP button to convert start or stop the LAP recording function, each press of MODE button records a set of data LAP and displays LAP timer for 3 seconds then changes display to speed mode automatically, press and hold the LAP button for 2 seconds to go out LAP mode and return to normal mode.
 - b. The first data of recording function will be renewed by new data when lap exceeds 99 laps, then each new data renews earliest data one by one.

LAP review operations:

1. In the LAP mode, press MODE button to review the 1st stored data, it displays number of lap and lap timer.
2. Press the RESET button to switch between lap timer of the same LAP; each press of the MODE button displays data for the next lap.
3. Press and hold LAP buttons for 2 seconds to go out LAP mode and return to normal mode.

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 Size	Circumference number (mm)	Tire Size	Circumference number (mm)	Tire Size	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

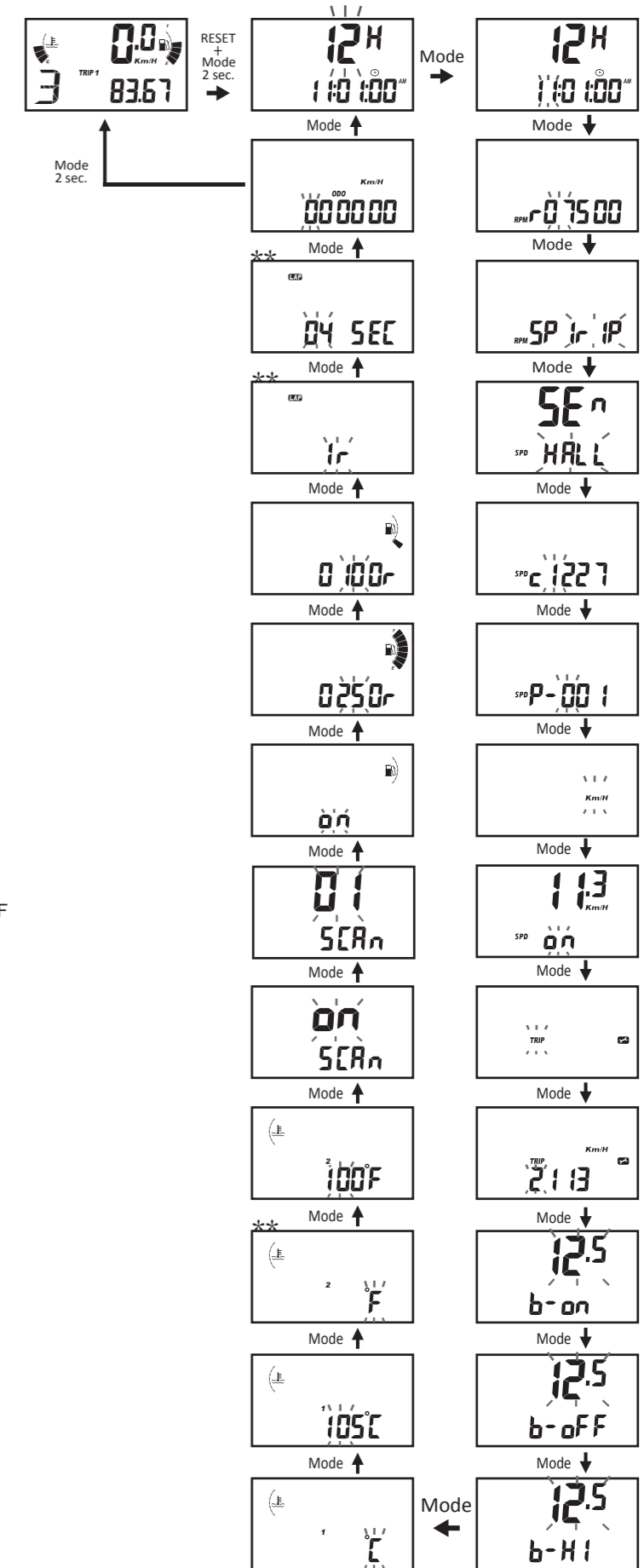
3. These values are approximate and will differ for different brands of tyre, we would always recommend that you measure the distance travelled per revolution of the wheel in mm and enter this into the computer.
4. The computer calculates the wheel rotating length between 2 passes of the magnet; use 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 enter the number of turns of the cable perf the wheel into the pulses screen.
6. You can use more magnets, enter the number of magnets fitted into the pulses screen.
7. If using a sprocket tooth counter speed sensor or internal pulse gearbox speed sensor enter the number of pulses per wheel revolution into the pulses screen.

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

1. Setup operations include 12/24hour clock, bar rpm scale, shift warning RPM, numbers of engine rotation per signal, wheel circumference, signal divider, units, maintain reminder, units of temperature, temperature warning, fuel meter input resistance selection and odometer adjustment. These must be set up step by step. The computer will be automatically revert to normal mode if no button is pressed for 75 seconds at any setting screen.
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 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 "12 or 24H and XX:XX:XX" symbols and AM/PM when you select 12H. Operate buttons as described in item 2 to finish clock setting and jump to shift RPM warning setting.
4. It displays the default "RPM r06500", the digit "0" flashes. Follow the item 2 of button operation to finish the shift RPM warning setting and jump to engine specification setting.
5. It displays "RPM SP 1r1P", the default value is 1r1P; there are 6 options: 1r1P, 1r2P, 1r3P, 1r4P, 2r1P, 3r1P,. "r" means the numbers of engine rotation, "P" means number of signals from engine. For example the value 2r1P means the engine rotates 2 turns to output one signal.
6. Press RESET button to move in loop sequence from one to another value of the 6 values. Press MODE button to confirm the setting and go to speed sensor type screen.
7. It displays SPD SEH HALL or SPD SEN rEEd, HALL type is for Acewell's unique 2 wires hall sensors only, rEEd type is for reed sensors, gear sensors and signals from ECU. A gear sensor has 3 wires and must be powered from the bike. Follow item 2 of button operation to confirm the sensor type and jump to wheel circumference setting screen.
8. In "SPD cXXXX" display, "c" means "Circumference", following 4 default digits; flashing digit is digit to be set. Follow the item 2 of button operation to finish the wheel circumference setting and jump to signal divider setting.
9. It displays "SPD P-001", the pulses screen, the number of pulses into the computer per turn of the wheel. Follow item 2 of button operation to finish the setting and jump to unit setting.
10. It displays KM/H or MPH, each press of RESET button converts unit; press MODE button to confirm unit setting and jump to decimal point setting.
11. It displays "99.9Km/H SPD & on" or "99Km/H SPD & oFF", the decimal point will disappear when Off is selected. Follow the item 2 of button operation to finish the decimal setting and jump to maintain reminder setting.
12. It displays ⚡ and TRIP, RT or oFF, TRIP is 1000km (621Miles) and RT is 100 hours by default. Follow the item 2 of button operation to finish the maintenance reminder setting and jump to voltage warning setting. The maintenance reminder function will be not be shown when "OFF" is selected.
13. It displays "☺ b-on and a flashing numbers of voltage" to be set, "b-on" means battery warning on voltage – when the voltage falls below this the LED will flash, setting range from 11.0 to 15.0V. It displays "☹ b-off and a flashing numbers of voltage", "b-off" means battery warning off voltage, setting range from 11.0 to 15.0V to, but ☺ b-off voltage must larger than b-on voltage – when this voltage is exceeded the LED will go off. It displays "☺ b-HI and a flashing numbers of voltage" to be set, "b-HI" means battery warning on voltage – when the voltage is exceeded the LED will come on, setting range from 11.0 to 15.0V". Follow the item 2 of button operation to finish the voltage warning setting and jump to thermometer 1 setting.
14. It displays "1.1°C, °F or oFF", each press of RESET button converts ,°C or °F Off, the temperature bars will disappear when you select oFF mode; press MODE button to confirm temperature setting and jump to temperature 1 warning setting.
15. It displays "1.1 XXX" and the selected unit. Follow the item 2 of button operation to finish the temperature warning setting and go to thermometer 2 setting.
16. thermometer 2 setting It displays "1.1 2 °C, °F or oFF", each press of RESET button converts °C, °F or Off, press MODE button to confirm temperature setting and jump to scan setting.
17. It displays SCAN and on or oFF, It displays "flash 01 & SCAN" if you select Scan on, it means the time in seconds to display each function, for example 05 means every 5 seconds auto change to the next function, the set range is 01-20. Follow the item 2 of button operation to finish the SCAN setting and go to fuel sensor resistance setting.
18. It displays "on, off or rES" and ⚡, it displays fuel tank and full bars as well flash XXXXr, it means full tank resistance setting, the setting range of "on" from 10r to 1000r. It displays fuel tank and one bar as well as flash XXXXr, it means empty fuel sensor resistance setting. Follow the item 2 to select a resistance same as your fuel sender and jump to sensor type of **LAP timer 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 1r, EF1, EF2 or EF3, 1r means you elect IR receiver as the sensor for LAP timer, and the selection of EF1, 2 or 3 is a magnetic field sensor for LAP timer, the number of 1, 2 or 3 is means the number of magnetic sensor in track, for example EF2 means the track has 2 magnetic sensor and it will combine 2 sensing signals in one.

20. **It displays flashing 01 and SEC, the range is from 01 to 20 seconds, the freezing time setting will ignore signals received by the unit within the set freezing time after it received a signal. Follow the item 2 to set freezing time and jump to odometer setting.
21. It displays "ODO & 00000X km", the "X" is from odometer testing in factory, follow item 2 to set a desired odometer value 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



RESET BUTTON

Reset button cycles through functions in reverse order

DATA RESETTING AND PROGRAMMING MODES

1. Press MODE or RESET button to reach the desired screen then press RESET button for 2 seconds to reset TRIP 2, MAX SPD, MAX RPM and MAX data from stored values to zero individually. The maintain reminder data will be reset to the preset value rather than zero.
2. The data of Trip 1, AVG & RT will all be reset at the same time when one of the 3 data functions is being reset.
3. ODO, clock, HRTT and TT data cannot be reset.



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.

Gear Indicator Tranning Operations:

1. If using a rear wheel or gearbox speed sensor, put bike on a rolling road or securely mounted centre stand, if measuring front wheel speed the following can only be done if the vehicle is moving.
2. Change the LCD screen to display digital RPM.
3. Press and hold MODE button for 2 seconds to go into the number of gears setting mode.