

OPERATING INSTRUCTIONS

Self Powered Digital Tach / Maintenance / Hour Meter



Please read and understand the following notices carefully, and correctly install and operate the product before using.



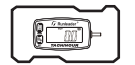
1. Please make sure to refer to the installation instructions in the operating instructions to avoid damage caused by installation errors.
2. The product included the battery inside and can be replaced, please pay attention to ensure the reliability of battery installation.
3. Do not pull the wiring when using it to prevent falling off or poor contact happened.
4. Please install the product in a proper location to avoid the possibility of this product being hit and prevent damage to the product.
5. The product has certain waterproof function, but can not be used in deep water or soaked in rain for a long time.
6. Please use the product at the specified temperature, high temperature environment may cause damage to the product.

PRODUCT ACCESSORIES LIST

1 Product*1	2 Runleader color box*1	3 User manual*1
4 3M adhesive velcro*1	5 Battery CR2032*1	6 Cable tie*2
7 Set screw*2	8 M3 hex nut*4	9 Flat washer*2

PRODUCT INSTALLATION

1. Velcro installation:



- a) Clean properly the surfaces.
Note: Make sure the surface is flat and the oil is clean enough.
- b) Paste the velcro hook side in the installation position.
- c) Paste the velcro fluffy side on the back of the product.
Note: Before pasting velcro, please make sure the back of the product is clean and tidy, no moisture or oil.
- d) Paste the product on the hook side of the velcro and press it tight.

Proper position requirement: no moisture, no grease, is a plane, no violent vibration, and the temperature not exceed 125°F.

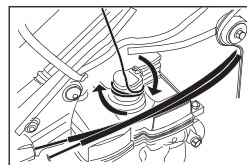
2. Signal wire installation.

Signal wire connection: wrap the signal wire around the spark plug, wrap it 4 to 5 turns, and fasten it with a cable tie to ensure it is effectively fixed and will not loosen. **(If the connection is not strong, the tachometer will get insufficient signal, then the RPM and Hour values will be inaccurate.)**

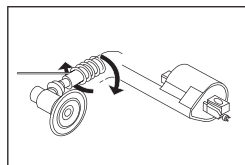


- a) For traditional ignition modes, wrap signal wire 4 to 5 turns tightly around the engine spark plug wire.
- b) For "pencil coil" ignition, wrap signal wire around the plastic coil above the spark plug.
- c) The spark plug signal generated by different engine types has the difference of strength and weakness. By adjusting the turns of winding, the appropriate adjustment can be made to improve the accuracy of the RPM and timing data. This is a skill that different degree spark plug signal that allows the induction wire to acquire.

Under the normal conditions, you can increase the winding turns if the RPM is low and reduce the winding turns if the RPM is high.



4 stroke installation wrap pickup wire around head of coil.



2 stroke installation wrap pickup wire around spark plug lead.

PRODUCT OPERATION

1. Programmable firing patterns ---- Determined the amount of pluses(sparks) per engine revolution.

This product provides 8 programmable firing patterns, which can be selected according to the corresponding relationship in the form below.

Engine firing patterns	Engine type	Spark plug firing and engine rotate laps	RPM Capacity
1P1R	4 stroke 2 cylinder	1 spark per revolution	20000
	2 stroke 1 cylinder		
1P2R	4 stroke 1 cylinder	1 spark 2 revolution	20000
	2 stroke 2 cylinder		
2P1R	4 stroke 4 cylinder	2 spark per revolution	10000
	2 stroke 2 cylinder		
3P1R	4 stroke 6 cylinder	3 spark per revolution	6000
	2 stroke 3 cylinder		
3P2R	4 stroke 3 cylinder	3 spark 2 revolution	13000
4P1R	4 stroke 8 cylinder	4 spark per revolution	5000
5P2R	4 stroke 5 cylinder	5 spark 2 revolution	8000
	4 stroke 12 cylinder		
6P1R	4 stroke 6 cylinder	6 spark per revolution	3000
	2 stroke 6 cylinder		

Note: Some of 4 stroke 1 cylinder engine is 1P1R, the setting is in the same way as the 2 stroke 1 cylinder engine.

■ To set the tachometer (Spark plug firing revolution):



- a) Press the "MENU" button 5 times until display shows "1P1R" icon.
- b) Press and hold the "MENU" button until display shows "1P1R" icon flashing, release and press "MENU" or "SET" button to toggle through all engine firing patterns setting.
- c) Stop at correct firing pattern setting for your engine.
- d) Wait for 10 seconds and display will return to "TOT" total hours. (Tachometer is now ready to use)

Note: If the obtained RPM is not accurate, for example, the RPM is half of the actual RPM, you can adjust it by programming the firing patterns.

2. RPM ---- Typical RPM display during operation of the engine.

a) When the tach hour meter detect the engine spark plug signal for more than 1s continuously, the LCD will display the current RPM of the engine.



b) The RPM will be refreshed every 0.5s.

c) Different programming setting will get different RPM; Please follow the instructions in section 1 to programming setting for accurate programming.

3. MAX RPM ---- Display the maximum RPM recorded. During the last period of operation.



- **To view MAX RPM:** press the "MENU" button 4 times until display shows the "MAX RPM" icon.
- **To reset MAX RPM:** press and hold the "MENU" button until display shows "MAX RPM" and "00000" flashing, MAX RPM is reset.



4. Alert RPM ---- Set the reminding RPM value, and remind you when the RPM value is exceeded.



a) Press the "MENU" button 3 times until display shows the "RPM" and "Δ" icon.

b) Press and hold the "MENU" button until display shows the RPM value flashing, release the button. When the RPM value start flashing, the backlight color will change to red simultaneously.

c) Press "MENU" button or "SET" button until you get desired RPM value, release the button, the LCD will flash for 10 seconds and return to "TOT" (Total hours).

When the RPM value exceeds "Alert RPM", the red backlight, warning symbol and current RPM value will flash to remind.

5. RPM refresh rate ---- The updating speed of the RPM.



a) Press the "MENU" button 8 times until display shows the "0.5" icon.

b) Press and hold the "MENU" button until display shows the "0.5" flashing, release the button.

c) Press the "MENU" button or "SET" button until you get desired RPM refresh value, release the button, the LCD will flash for 10 seconds and return to "TOT" (Total hours).

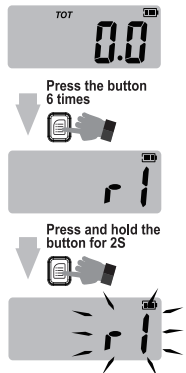
The refresh rate has 2 groups for choosing, the refresh rate 1.0 will be a little slower than 0.5.

Note: The different refresh rate may result in different RPM value, it does not mean the inaccuracy of the value, just mean the display speed of the real-time RPM.

6. RPM measurement range ---- Selecting the right measurement range will help you get more accurate engine RPM data.

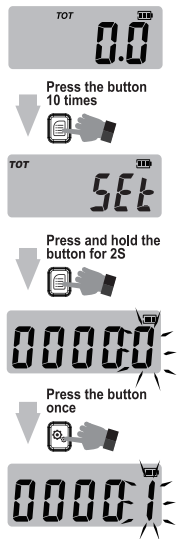
Range Selection	Measurement Range	Remarks
r1	0-20000 RPM	<ul style="list-style-type: none"> ■ Different measurement RPM ranges are selected to ensure better anti-jamming performance of the tachometer to obtain accurate RPM data. ■ The default speed measurement range is r1.
r2	0-18000 RPM	<ul style="list-style-type: none"> ■ Real-time RPM data beyond the RPM measurement range will not be displayed accurately.
r3	0-12000 RPM	<ul style="list-style-type: none"> ■ The RPM data obtained under different RPM measurement ranges may be different.
r4	0-6000 RPM	

■ Selection of RPM measurement range.



- Press the "MENU" button 6 times until the "r1" icon appears on the display.
- Press and hold the "MENU" button until display shows "r1" icon start flashing, release and press "MENU" or "SET" button to toggle through all RPM measurement range setting.
- Release the button and wait for 10 seconds and display will return to "TOT" total hours. (The setting of the RPM measurement range is completed)

7. Hour meter initial time setting ---- You can program a start hours (old hour meter data) to replace an old hour meter.



- Press the "MENU" button 10 times until the "TOT" and "SEt" icon appears on the display.
- Press and hold the "MENU" button until display shows "0000.0" icon start flashing, release and press "SET" button to get the number you want, and the "MENU" button to select the value digit.
- Release the button and wait for 10 seconds and display will return to "TOT" total hours. (The setting of the hour meter initial time is completed)

Note: The initial time setting will not be set again after 1 hour of engine operation.

8. Record the number of engine starts.

Press the "MENU" button 7 times until only the number appears on the screen. This number indicates the cumulative number of engine starts.



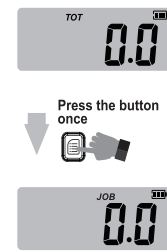
9. TOT ---- Total hours of operation.



- This is always displayed when engine is off.
- Total hours can not reset.
- The total hours max value is 99999; When the total hours range is 0.0-9999.9H, the timing accuracy is 0.1H; When the total hours range is 10000-99999H, the timing accuracy is 1H.

d) When the total hours exceeds 99999 hours, the timing will restart from 0.0.

10. JOB ---- Hours of operation since the timer was reset.

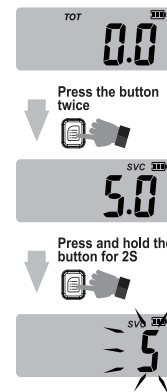


- To view "JOB" time; press the "MENU" button once until display shows "JOB" icon.
- To reset "JOB" time; press and hold the "MENU" button until display shows "0000.0" flashing, then release the "MENU" button, the "JOB" display will reset to "0.0", and it will begin to record the next job interval.

11. SVC ---- Maintenance interval time. **Note:** Timing is countdown.

■ When the maintenance interval time is reached, and the LCD display will flashing, and press the "MENU" button or "SET" button to clear the status, the next maintenance interval time starts timing.

■ Programming SVC time:



- Press the "MENU" button twice until display shows "SVC" icon and maintenance interval time.
- Press and hold the "MENU" button until display shows maintenance interval time flashing.
- Press "MENU" button or "SET" button until you get desired hours, release the button, the LCD will flash for 10 seconds and return to "TOT" (Total hours). When the maintenance interval time reached to 0, the "SVC" icon will flash.

12. Backlight choice.



- Press the "MENU" button 9 times until display shows "L-Aut" icon.
- Press and hold the "MENU" button until display shows "L-Aut" icon flashing.

c) Press "MENU" button or "SET" button until you get desired mode, release the button, the LCD will flash for 10 seconds and return to "TOT" (Total hours).

L-Aut	the backlight will be automatically turned off, when pressing the button, the backlight will be on.
L-ON	the backlight is always on.
L-OFF	turn off the backlight display.

The choice of backlight mode will have a direct impact on battery life, and the L-ON mode is the largest power consumption.

13. Battery replacement.

- The battery capacity icon will always appear on the display screen at any display interface.
- The battery capacity bars graph as below, when the battery capacity is not enough, the battery icon will flash to remind you to replace the battery.



14. To shut down LCD display.



- Press the "MENU" button until display shows "TOT" icon.
- Press the "MENU" and the "SET" button simultaneously until display shows "OFF" icon, then release the button, the LCD display will shut down.

- Once detect the continuous engine signals within 8 seconds, or press the "MENU" or "SET" button again, the LCD screen will be displayed.
- When LCD screen is closed, the historical data will be retained and will not be cleared.

15. Other.

1. To extend the life of your product, you can apply it as follows:

- Avoid product that is always in a very humid environment --- there is a risk of moisture intruding inside the product, causing the product to consume more electricity.
- Avoid product that is always in a high temperature environment (exceed 125°F) --- high temperature environment has the risk of increasing the discharge rate of the internal battery.
- Minimize the frequency of button operations --- continuous button operation, function switching, the power consumption will increase.
- Minimize the measurement at high speed (more than 15000RPM) --- In the case of ultra-high engine RPM, the data calculation load of the internal IC of the product will increase, and the power consumption will increase.

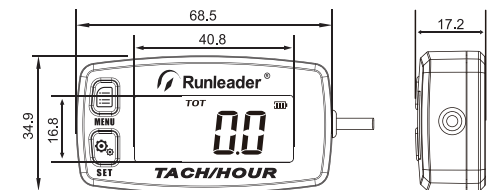
2. There are several cases about the service life of the battery (This is the theoretical calculation, the actual battery life is related to the applicable conditions):

- If you use 8 hours per day (RPM=4000), do not turn off the display when not in use: the battery life is about 1.6 years under L-Aut mode; The battery life is about 2.2 years under L-OFF mode; The battery life is about 3 days under L-ON mode.
- If you use 8 hours per day (RPM=4000), turn off the display when not in use: the battery life is about 2.7 years under L-Aut mode; The battery life is about 3.7 years under L-OFF mode; The battery life is about 10 days under L-ON mode.
- If you use 24 hours a day (RPM=4000): the battery life is about 1.6 years under L-Aut mode; The battery life is about 1.5 years under L-OFF mode; The battery life is about 3 days under L-ON mode.
- If you use 8 hours per day (RPM=15000), do not turn off the display when not in use: the battery life is about 1.2 years under L-Aut mode; The battery life is about 1.7 years under L-OFF mode; The battery life is about 3 days under L-ON mode.
- If you use 8 hours per day (RPM=15000), turn off the display when not in use: the battery life is about 1.8 years under L-Aut mode; The battery life is about 2.5 years under L-OFF mode; The battery life is about 9.5 days under L-ON mode.

PRODUCT SPECIFICATIONS

Model	RL-HM032C
TOT/JOB Timing range	0-99999H
Timing accuracy	0.1H/1H
RPM range	0-20000RPM
MAX RPM range	0-20000RPM
Alert RPM setting range	1000-20000RPM
RPM accuracy	10RPM
RPM refresh	0.5s or 1.0s
Firing patterns	1P1R 1P2R 2P1R 3P1R 3P2R 4P1R 5P2R 6P1R
SVC setting range	0-200H
Backlight mode	Aut / ON / OFF
Display mode	LCD
Display window size(visible)	40.8x16.8mm
Product size	68.5x34.9x17.2mm
Battery type capacity	CR2032 210mAh
Waterproof class	IP65
Button color	Red / Blue / Black

PRODUCT DIMENSION



Unit: mm

