Thank you for purchasing the Motor Analyzer. We are confident you will find it to be an indispensable tool to make your hobby more fun and enjoyable.

Brushless motors are the most popular motor choice now in the RC Car and model aircraft industry. With their superior power to weight ratio, a large range of sizes, from under 5 grams to large motors rated at thousands of watts, they have revolutionized the market for electric-powered model field.

The motor analyzer is a precision electronic device that is especially designed for measuring the KV value, RPM, current drawn, motor timing, vibration noise level and checking the function of hall effect sensors of a brushless motor. It comes with a 2x16 characters LCD that is able to display real time measuring value of either sensor or sensor-less brushless motor.

In order to measure the RPM and KV value correctly, you need to select the magnet poles number according to the motor you are testing. The default values of this motor analyzer for car motor are 2 poles.

For magnet poles other than 2, you need do the setting as following:

1. Turn Rotary Dial
2. Press Rotary Dial again number of pole will blinking
3. Turn Rotary Dial to select number of pole
4. Press Rotary Dial again to confirm number of pole

Specifications:
- Input Voltage: 7.4-8.4V (Suggested to Use 2S LiPo Battery)
- LCD Display Screen: Blue Backlight Background, White Text, 16 Characters X 2 Lines
- KV Value Accuracy: ±1.5%
- Motor Timing Accuracy: ±1.4%
- Motor Timing Range: 0°-70°
- Noise Level Measurement Range: 0-120dB
- Dimension: 136.5mm x 80.6mm x 24.5mm
- Net Weight: 233g (Without Cable)
- Support Motor: Sensor or Sensor-less Brushless Motor (2 Poles to 36 Poles)
- Current Drawn Less Than 30A at 8.4V Without Loading
3. Motor Timing

Motor Timing
Press to Start
Motor Timing
Press to Start
Motor Timing
Press to Start

The performance of the motor is not related entirely to the endbell timing. It also depends on alignment and quality of internal parts such as sensor board and rotor.

Above picture shows the actual timing of three sensor elements. This feature shows how the timing of your motor's sensor. Ideally, when the timing of your motor is 0°, you want the three sensor elements connected to A, B, and C to show exactly the same number of degrees. However, it is very difficult to get the same results in reality. All manufacturers have varying degrees of precision in their products. The values of each A, B, and C sensor are dependent on production batch and how well the sensor chip is aligned on the PCB. The distance between sensor and rotor can affect the reading as well.

Slight difference between these values makes a good sensor board.

The Motor Analyzer may not show the same KVP value and Degree of Timing as the manufacturer claims. The KVP value and Degree of Timing are dependent on many related things to the conditions under which the motor is running. Motor Analyzer run all motors under the same working conditions and make it easier to compare between the products.

3. NOISE LEVEL

NOISE LEVEL: Poor assembly motor, inferior bearing and unbalanced rotor can generate a vibration. Whenever a motor in a vehicle, it causes compression waves in the air. These waves move away from the motor as sound or noise.

Vibration noise of motor is adverse the performance of motor. By measure the noise level of motors, you can select the less noisy motor.

The decibels (dB) is a logarithmic unit used to express noise level in this motor analyzer.

4. HALL EFFECT SENSOR TEST (BRUSHLESS MOTOR WITH SENSOR ONLY)

Brushless-motor (with an extra six wires harness, connected to Hall Effect Sensors). Hall sensors are commonly used to time the speed of wheels and shafts, such as for internal combustion engine ignition timing or tachometers. They are used in brushless DC electric motors to detect the position of the permanent magnet.

After power up the motor analyzer or after the STOP key is pressed to stop the motor running, it will enter to the Hall Effect Sensor Test mode automatically. If the sensor harness is connected to the sensor connector of the unit, one or two of the sensor LEDs will be light up that show the corresponding sensors are function correctly.

Rotate the rotor for a step, and then the light up sensor LED will be changed. For example, if the sensor A LED is light up, after the rotor is rotated by a step, then the sensor A and B LEDs will be light up at the same time. If rotating the rotor by a step again, sensor A LED will be light off and sensor B LED will be light up only.

For a proper sensor operation, LED should be light up according to the below sequence;

A B C A B C A B C A B C A B C

LED A -> LED A B -> LED B C -> LED C A -> this sequence will be repeated if the hall effect sensors are functioning properly.

The following phenomena shows that the motor Hall Effect Sensor do not work properly.

- The LED light up sequence is not correct
- All LEDs light up at the same time
- All LEDs light off at the same time

SAFETY PRECAUTIONS

Please read the Instruction Manual before starting to operate the motor analyzer. For those users that do not have experience to use it, please seek help from the professional users. Please make sure the voltage apply to the unit is within the required range. (7.4V-8.4V) and polarity should be connected properly.

IF THE INPUT POWER POLARITY IS REVERSED, THE UNIT MAY BE BURNED OUT.

For some high KV motor, torque and loading working is not suggested. Motor and this unit will generate heat during operation.

ERROR MESSAGE

When the message RUN ERROR is appeared, please check and reconnect the sensor cable and A, B, C motor wires to the unit again. Make sure A, B, C motor wires are connected to the corresponding A, B, C socket on the unit. And please make sure there is no short circuit of A, B, C connector. If the error message still appeared, the tested motor may be failure.

WARRANTY AND SERVICE

We guarantee this product to be free of manufacturing and assembly defects for a period of one year from the date of purchase. The warranty only applies to material or operational defects, which are present at the time of purchase. During that period, we will repair or replace free of service charge for products deemed defective due to such causes.

For any repair or replace service, please contact your dealer in the first instance, who is responsible for processing guarantee claims. This warranty is not valid for any damage or subsequent damage arising as a result of misuse, modification or as a result of failure to observe the procedures outlined in this manual.