



ITEM#: WRL-WATTM

Congratulations on your purchase of the Inspector Wattmeter. The Inspector Wattmeter is an easy-to-use precision instrument for measuring and calculating the electrical parameters of any radio control model. These parameters would be used to optimize your electric model to its top performance.

The Inspector Wattmeter measures the real-time current (Amps), voltage (Volts), peak current, minimum voltage, power (Watts), charge (Amp-hour) and energy (Watt-hour) for the electric model that it's connected to. This will allow you to investigate and tune the performance of your R/C model to its optimal performance. You can also determine critical things such as efficiency and current consumption of an ESC (electric speed control), BEC (battery eliminator circuit) and motor, battery health, presence of damaging peak currents and power consumption/lost at all conditions. These precise measurements and data will help you fine tune your R/C model to get the proper performance and provide a safe and consistent power source. The Inspector Wattmeter is designed and manufactured in Canada with the leading edge micro-controller technology and robust components that will "inspect" most high power applications.

**Please read the entire manual and safety issues before proceeding.**

**Features:**

- Ultra compact watt meter and power analyzer that will fit in any radio controlled model.
- Measures current (A), voltage (V), power (W), charge (Ah), energy (Wh), peak current (Ap) and minimum voltage (Vm).
- Wide range of input voltage from 0-60 V and input current of 0-100 A.
- High precision and accuracy of 0.01 Amp and 0.1 Volt resolution.
- High current capability up to 50 Amps continuous and 100 Amps peak at 60V.
- Compact and light weight LCD display gives visual feedback with user selectable display.
- Uses leading edge 25 MIPS (million instruction/second) micro-controller with 16 bit resolution ADC (analog to digital converter).
- High quality power components and wires to withstand high voltage/current with no interference.

**Package Contents:**

- Inspector Wattmeter unit
- User Instruction Manual

**Specifications:**

Table 1 - Electrical Measurement Range

Units	Range	Resolution	Comments
Voltage	4 to 58-60V	0.01 V	
Voltage	0 to 58-60 V	0.01V	with auxiliary power
Current	0 - 50 A	0.01A	100 A peak current
Power	0-6000 W	0.1W	
Charge	0-99 Ah	0.001Ah	
Energy	0-9999 Wh	0.1 Wh	

Table 2 - Technical Specifications and Operating Limits

Parameter	Value
Source Voltage Input	0 - 60 Volts
Auxiliary Voltage Input	4 - 60 Volts
Load Current	50 A Cont. / 100 A Peak
In-Circuit Resistance	0.001 Ohm
Dimensions	40 x 40 x 11 mm
Weight	42 grams
Display Screen	2 x 8 Character

**CAUTION: Exceeding the above limits will cause damage and fire and may cause personal injury.**

**CAUTION: High power electrical systems pose dangers independent of the Inspector Wattmeter and it is the user's responsibility to be familiar with these dangers and take necessary action to ensure safe use. Incorrect installation and connections outside of specified operating ranges or inadequate knowledge of electricity, batteries, battery chargers, and wiring have serious consequences that may lead to damage and injury to equipment and personal. Please carefully read the entire manual before proceeding with product use. This product is not recommended to be used by personal with no knowledge of high power safety.**

**NOTE: Treat the Inspector Wattmeter as a pass through wire between the Battery SOURCE to the LOAD (eg ESC and Motor). When connecting a battery to the SOURCE side of the Inspector Wattmeter and a load to the LOAD side, is like connecting the battery directly to the load.**

**Installation:**

1. Connections: **Please disconnect any battery sources that would connect to the applied circuit.** Connect the wires on the "LOAD" side of the inspector wattmeter to your load such as your ESC with a motor. It is recommended to solder the "LOAD" side wires to a female connector for ease of installation. The **Red "LOAD" wire will be the positive (+) connection and the Black "LOAD" wire will be the negative (-) connection.** The wires on the "SOURCE" side would connect to the source battery terminal and it is recommended to solder these wires to a male connector. The **"SOURCE" red wire goes to the positive (+) and the black wire goes to the negative (-).** The user is responsible for selecting connectors that are rated to handle the expected current and voltage according to the user's application. If Auxiliary Power is not used, please use a minimum of 4 cell NiCd or NiMH battery pack or 2 cell Li-Po battery pack on the source side to provide a minimum of 4 V.

2. Using Auxiliary Power: A separate receiver battery or other power source of 4 V minimum can be connected to the 3 pin connection on the "SOURCE" side of the Inspector Wattmeter. This will allow the unit to measure the SOURCE battery down to 0 V. **Ensure the positive (+) center pin and negative (-) terminals match**

**Installation (cont'd):**

properly before connecting the 3 pin auxiliary power.

**CAUTION!** Never short any of the wire leads when the source is connected as it can cause damage and fire. Make sure there are no loose connections or exposed bare wire where shorts are probable before connecting the "SOURCE" battery. Check all battery polarities are correctly matched.

3. When the power source is applied, the Inspector Wattmeter will boot up with LCD screen displaying the title "INSPECTR WATTMETER" followed by the version number for a few seconds. Then it will begin measurements.

**Setup:**

1. **Measurement Screen:** After the boot up screen upon power up, the LCD screen will display the measurement screen consisting of Volts and Amps. The Inspector Wattmeter will continuously display the live data on it's screen.

To display the other measured values, simply press the push button located below the Wattmeter's LCD screen and the next two measured values will appear. Press the button again to scroll through the next two sets of measured values to be displayed; the measured values will be displayed sequentially as shown below as the push button is pressed. All data values are identified by their units (V, A, W, Wh, Vm and Ah).

60.0 V	6000.0 W	99.999Ah	6000.0Wp
100.00 A	9999.9Wh	100.00Ap	00.0 Vm

**Voltage V - Minimum Voltage Vm:**  
The Voltage value (V) displayed is the current voltage that is present on the SOURCE side. The displayed Minimum Voltage value (Vm) is the minimum voltage measured on the SOURCE side since after the boot up screen.

**WARNING:** Do not measure any source over 60 volts as it may result damaging the unit.

**Current A - Peak Current Ap:**  
The Current value (A) is the current ampere flowing through the LOAD side. The displayed Peak Current (Ap) is the maximum current drawn on the LOAD side since after the boot up screen.

**WARNING:** Do not measure currents over 50 A for a long period of time as overheating can result.

**Wattage W - Peak Wattage Wp:**  
The Wattage value (W) displayed is the current power in Watts drawn from the LOAD side. The displayed Peak Wattage (Wp) is the maximum wattage drawn on the LOAD side since after the boot up screen.

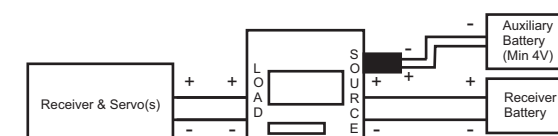
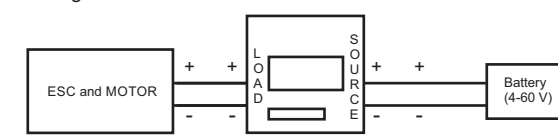
**Charge - Amp hour Ah:**  
The Charge value (Ah) displayed is the total charge in Amp hours delivered to the LOAD since after the boot up screen. The wattmeter accumulates the amperage reading over the measured period. For accurate results, be sure not to interrupt the SOURCE or LOAD connection during a charge measurement.

**Setup (cont'd):**

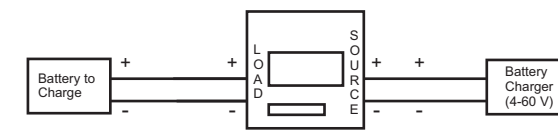
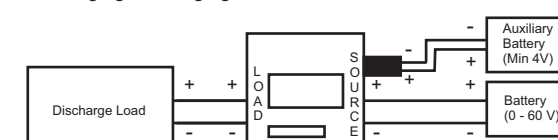
**Energy - Wattage hours Wh:**  
The Energy value (Wh) displayed is the total energy in Wattage hours is delivered to the LOAD since after the boot up screen. The wattmeter accumulates the wattage reading over the measured period. For accurate results, be sure not to interrupt the SOURCE or LOAD connection during an energy measurement.

2. The following diagrams are some typical setups of how the Inspector Wattmeter is applied:

**Testing Loads:**



**Discharging & Charging:**



**CAUTION:** Do not charge or discharge a battery beyond the manufacturer's specification as damage, explosion and fire may occur. Do not leave the charging and discharging battery unattended.

**TROUBLESHOOTING:**

**Q:** The Inspector Wattmeter does not turn on when power is applied?

**A:** Check if the power source is at least 4 Volts or higher and the connections are secured tightly with the correct polarity. Make sure there are no shorts on the LOAD and SOURCE leads.

**Q:** Unit does not turn on when Auxiliary Power is applied?

**A:** Make sure the Auxiliary 3 pin power plug is secured with the correct polarity. Positive (+) red is center Pin 2 while Negative (-) black is Pin 1 closest to the unit. Check if the Auxiliary Power source is at least 4 Volts or higher.

**Q:** I only see the voltage and amperage data values only and not the other measured values?

**A:** Press the push button located below the LCD screen to scroll through the other measured values.

**Q:** Minimum Voltage always reads 0 Volts when I apply Auxiliary Power only?

**A:** This is normal as no SOURCE battery is connected when the device is powered. It reads 0 Volts after the boot up screen and keeps that in the memory as the minimum voltage. The SOURCE battery needs to be connected first to avoid reading 0 Volts as the minimum volts. Remove power to the Inspector Wattmeter to reset the minimum voltage reading.

**Q:** The wire leads are getting warm?

**A:** This is normal when operating with higher currents. Make sure not to operate the unit beyond the specified current and voltage ratings.

**Q:** When there is no LOAD connected, the Inspector Wattmeter reads a small Amp reading and this is the same for voltage when no battery SOURCE is connected (Auxiliary Power connected)?

**A:** This is normal when no LOAD or SOURCE is connected to detect very small noises on open leads. This will not occur or affect the measurements when a LOAD and SOURCE is connected.

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**Limited Warranty (North America Only)**

The Inspector Wattmeter is guaranteed to be free from defects in material and workmanship for a period of 90 days from the date of purchase accompanied by the proof of purchase or invoice. Warranty does not cover damage due to improper use or incorrect installation. During the 90 day warranty period, if the product shows defects caused by abuse, accident or misuse, it will be repaired or replaced upon Western Robotics Ltd. sole discretion, at a service charge not greater than 40% of the current retail list price. Please ensure to include your contact information before any repair(s) or replacement(s) can be conducted. Under no circumstances or condition will the purchaser be entitled to consequential or incidental damages. In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provision without notice. Because Western Robotics Ltd. has no control over connection and use of this product, no liability may be assumed nor will be accepted for damage resulting from the use of this product, user accepts all resulting liability. If you attempt to disassemble, modify or repair this unit yourself, it may void the warranty.

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