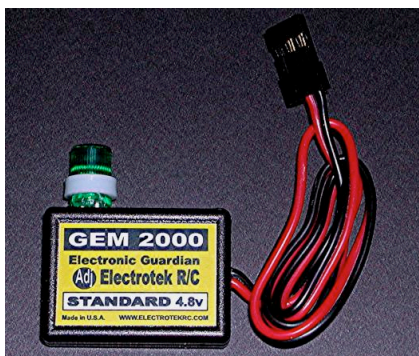




Gem 2000 "Electronic Guardian"

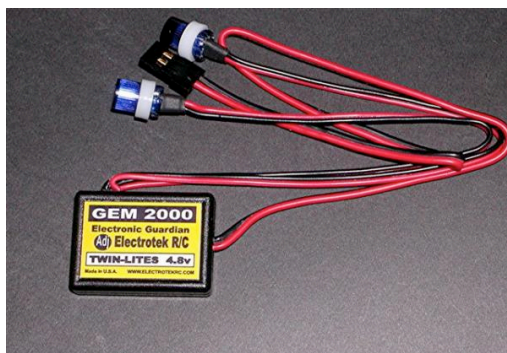
*The *GEM 2000 (G2K) is far more than a battery monitor. It's a versatile, uniquely designed "real-time" early warning trouble shooting instrument that detects/alerts users to problems and potential failures for the seven most common onboard failure points. Also, on/off status.*



GEM 2000 - Standard



GEM 2000 - Remote



GEM 2000 - Twin-Lites



GEM 2000 Tip-Lites Helicopter/Airplane

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[Electrotek R/C](http://www.electrotekrc.com)

14667 Lafayette Circle, Magalia, CA 95954

Info: 1 530 873-6230

Support & Orders Toll Free, USA, Canada, Puerto Rico: 1 888 567-2862

E-mail: Tech Support, support@electrotekrc.com General Questions, info@electrotekrc.com



General Information

Congratulations! You have invested in the finest, most uniquely simple, yet sophisticated onboard systems monitor available today. The GEM 2000 is a quality precision instrument designed to provide you with a lifetime of dependable and reliable service. You'll find it will make your R/Cing time at the field more worry free, enjoyable and safer!

Sooner or later all R/Cers experience a disaster due to an onboard systems or power failure which usually could have been detected and corrected before operating. This of course is the GEM 2000s primary purpose.

Simply follow one of the easy installation methods, turn on the Tx or Rx and watch the laser bright red LED during your pre-check. The GEM 2000 continually and automatically runs a diagnostic systems check on 7 potential problem areas with one or more of the following: voltage potential, current, continuity and RFI. The seven areas are: Battery Pack, Receiver, Switch Harness, Servos, Rx Filters, Xtal and RF Tuning Circuit.

The GEM 2000 uses the models entire onboard electronic system for load (resistance), which makes it more accurate and reliable than an ESV. Its a full-time Electronic Guardian and is quite easy to interpret.

Monitoring Status

- 1) Flashing LED (even pulsing) Go - (All systems OK)
- 2) Flashing LED (erratic pulsing) No/Go - Switch harness problem.
- 3) Steady LED Glow No/Go - Recharge (batteries have less than 30% power available).
- 4) Dark LED No/Go - Switch off or electronics failure (circuit breakdown in RX or switch).
- 5) Servo(s) Jitter No/Go - Filter system or Xtal problem.
- 6) Ground Range reduction No/Go - Tuning Circuit problem.

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FEATURES:

- 1 Laser brilliant
- 2 Micro-processor controlled
- 3 Rugged state of the art smt circuitry
- 4 Very low current drain
- 5 Ultra light & small
- 6 Easy installation
- 7 Simple plug & go operation
- 8 25+ % power safety margin
- 9 Eliminates frequent esv checks
- 10 Continual & automatic operation when RX is on
- 11 Realtime "dynamic" battery load monitoring
- 12 RX fault detector
- 13 Switch harness fault detector
- 14 Servo jam/bind detector
- 15 Filter system / xtal fault detector
- 16 Tuning circuit fault detector (auto range)
- 17 On/off status indicator
- 18 Adjustable monitoring voltage (4-10volts)
- 19 Water/weather & fuel proof
- 20 Shock/vibration proof
- 21 Gold plated connector
- 22 Automatic recharge reminder
- 23 8 models: led mounted on unit or led on remote wire. monitor 1-4 separate power systems simultaneously w/laser brilliant LEDs
- 24 Unconditional lifetime warranty
- 25 Money back satisfaction guarantee

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Primary Functions:

BATTERY PACK

Corner / circle Tx sticks to induce full load. If LED trips to steady glow and flashes when load is released there's more than 30% power reserve. If only 1 or 2 servos trip LED . . . recharge. The LED flash will slow as power weakens.

RX FILTER(S) MALFUNCTION

The Rx filtering system is critical to RF signal integrity as is the frequency Xtal. RF waves fill the air everywhere and will eventually cause loss of control if your Rx filter(s) or Xtal malfunction due to excessive vibration or severe impact. When the Rx and Tx are both on the GEM 2000 detects this problem and alerts you by causing the servo(s) to jitter when the LED is flashing. Repair or replace Rx before operating model.

Rx TUNING CIRCUIT

If the Receivers RF tuning circuit has a problem your range may be intermittently or continuously reduced causing unexpected loss of control. The GEM 2000 will alert you by intentionally reducing ground range significantly making the malfunction extremely obvious. First, establish your approximate ground range without the GEM 2000 plugged in and then plugged in. If there is a significant difference you have a problem. Repair or replace the Rx before operating model.

NI-CAD FAILURE / WEAKNESS

A bad or weak cell in a charged pack will quickly "drag" down other cells particularly under servo load. Even with a freshly charged pack the GEM 2000 will quickly show a steady glow.

SERVO STALL

If a servo stalls from linkage binding or gear failure an excessive electrical load will be induced causing the GEM 2000 to glow steady anywhere from immediately to a minute or two depending on severity of stall and state of battery pack.

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INSTALLATION METHODS

A) *Chrome LED Holder*

Step 1 Drill 5/16 hole through mounting surface

Step 2 Insert holder through hole and secure with washer & nut

Step 3 Push LED snugly into backside of holder & secure with Servo tape or hook & loop

Step 4 Plug connector into any open Rx channel (if none are available, use either a Dual or Y extension wire)

Remote Unit - Same procedure but soft mount or secure box.

B) *Plastic LED Holder*

Step 1 Drill hole through mounting surface.

Step 2 Push holder in and secure with thin CA glue.

Step 3 Attach hook & loop to top of GEM 2000 and fuselage surface (shim with scrap balsa if necessary) and push LED into holder.

Step 4 Plug connector into any open Rx channel (if none are available, use a "Dual" or "Y" extension wire)

Remote Unit same procedure but soft mount or secure box.

C) *No Holder*

Same procedure as method (B) except drill a 3/16" hole. For flush or recessed LED mounting, shim with scrap balsa to desired LED depth and then secure with hook & loop.

D) *Hook & Loop*

Attach hook & loop to Servo tape and stick unit where easily visible through canopy.

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Voltage Adjustment Procedure

The GEM 2000 is factory pre-set to stop flashing at a point when there is 25 - 30% power available. If you desire to change this setting or recalibrate to accommodate a Regulator or BEC output use the following procedure:

- 1 Using Exacto #11blade lift label corner (Adj.) to expose micro pot
- 2 With jewelers slot head screwdriver drain or charge battery pack to desired trip point. Use digital voltmeter to verify.
- 3 Turn pot with screwdriver clockwise until LED flashes.
- 4 Turn pot counter-clockwise until LED just barely glows steady. The GEM 2000 is now calibrated to the new trip point voltage. The LED will flash above the voltage meter readout.

Technical data:

Dimensions:

Length	32mm 1-1/4in.
Width	23mm 15/16 in.
Height	7mm ?in.
Weight	7.1 grams (9.9 grams with chrome bezel).

Current drain:	004 amps at 5 volts
Led intensity:	3,000 mcd
Life expectancy:	10,000 hr. min.
Monitoring range	4 - 10 volts

Led status data:

4 cell pack	4.75 volts	+ = flashing
	4.74 volts	- = steady
5 cell pack	5.95 volts	+ = flashing
	5.94 volts	- = steady
Dark LED	0.00 volts	= RX off / voltage below 3.0 volts / RX or switch failure

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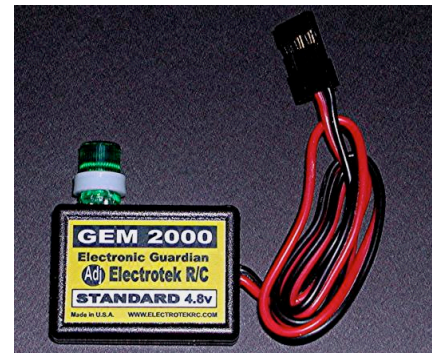
To isolate problem if led is dark proceed as follows:

- 1 Verify Rx switch in ON position If still Dark then . . .
- 2 Check voltage with ESV or DMM. If voltage registers then . . .
- 3 By-pass switch by plugging battery lead directly into battery port of Rx. If receiver operates servos then repair or replace the switch harness. If receiver does not operate servos, repair or replace RX

MODEL DESCRIPTION

GEM 2000 - Standard

LED is permanently mounted to side of module. Simply affix with supplied double sided tape and/or hook & loop to any flat surface on open bodied model. For models without see through body:



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