

# **EMS**

## **Electrical Management System**

### **Complete Installation/Operating & Warranty Guide**

**EMS-HW50C**  
**Rated at 240 Volts/50 Amps**

**Manufactured & Warranted**  
**by**  
**Progressive Industries**

**Sold & Serviced**  
**by**  
VIP Enterprises  
428 Childers Street  
Suite 847  
Pensacola, FL 32534  
Messages 800-422-4663 Ext. 847  
**Direct 734-516-2056**  
**office@viprv.com**

**www.viprv.com**

## Warnings:

DO NOT exceed the rating on the EMS for any reason. However this device is designed to be reduced down to 120V/15A, and still maintain full protection.

DO NOT modify the EMS in any way. This will void the warranty, compromise protection and could result in a possible shock or fire hazard.

It is important to always check the pedestal power outlet for charring; this condition means that the source receptacle is providing a weak connection. DO NOT use it. It could result in possible melting of the RV power plug.

Progressive Industries recommends that you have a certified electrician or an authorized dealer perform the installation of the EMS and any future repairs that may be required.

VIP Enterprises recommends that you use qualified personnel.

When running extension cord(s) from the RV to a power source always use appropriate size cable. Make sure that the cable is rated for outdoor use to reduce the risk of electrical shock. The smaller the cable the higher resistance and more voltage loss, plus it may result in an electrical fire.

Whenever servicing or installing the EMS, or any other AC power device, make sure that the power is disconnected from the source.

The telephone *type* cable that connects the EMS control box to the remote display is designed specifically for the EMS. Consequently do not use store purchased cable, it may cause the EMS to malfunction. It also may not have the appropriate voltage and current rating for the application; this could result in possible shock and fire hazard.

RV wiring is different than the wiring found in homes. The neutral and ground wires are isolated in an RV. In a home they are tied together at the service panel. The reason, homes have a bonded ground system and RVs do not. Therefore never bond the neutral and ground together for any reason. This will create a ground fault condition and may result in electrical shock and/or fire hazard.

# Features

**High/Low Voltage Protection:** Whenever source power falls below 104 volts, or rises above 132 volts the EMS automatically shuts down power to the RV. Once the AC power source raises above 104 volts or below the 132 volt level the time delay indicator flashes for the preset time and then automatically restores power to the RV.

**Time Delay for Air Conditioner Compressor:** Whenever power is interrupted by the source or the EMS due to a fault condition, the built in time delay is activated. There are two settings on the EMS. One is 136 seconds, and the other is 15 seconds. Consult your air conditioner manual to see if it has a time delay built into it. If so use the 15 second delay if not use the 136 second delay.

**Five mode surge protection:** This feature provides full surge protection L-N, L-N, L-G, L-G, L-L, and N-G. Total joule rating is 3640, response time of <1 nano second.

**Surge Indicator:** In the unlikely event a power surge damages the surge protector circuit within the EMS (L-N, or L-G) the digital display error code will read E-10. This is your indication that it needs to be replaced.

**Reverse Polarity Protection:** If source power has reverse polarity the EMS will not allow power to the RV and the error code will read E1.

**Open Neutral Protection:** If the source has an open neutral the display will not light, and the EMS will not allow power to the RV.

**Open Ground Protection:** If source power has an open ground the EMS will not allow power to the RV and the error code will read E2.

**AC Frequency Protection:** If the source power frequency deviates + or - 9 hertz from 60 cycles per second the EMS will shut power down and the error code will read E7 or E8.

**Accidental 220V Protection:** If 220 volts is detected when plugging into source power the EMS will not allow power to the RV and the EMS will not be hurt. If this condition occurs while power is applied to the RV, the EMS shuts off power instantly. In either case the display will read the voltage and E3 or E5 will be displayed depending on the error.

**Remote Information Display:** The display continuously scrolls all of the power source information. E-0 (correct electricity) or E 1-10 (errors explained later) Voltage Line-1, Current L-1 (amps), Voltage Line-2, Current L-2 (amps), Frequency, and Previous Error. Each reading is displayed for 2 seconds.

**Previous Error Code (PE):** This feature tells the user why the EMS previously interrupted power to the RV. This is only displayed if an error actually occurs. PE is erased from memory when power is disconnected to the EMS.

**Bypass Switch:** This switch is located on the remote display. Switching to OFF allows the user to bypass the computer circuit in the EMS in the event of computer board failure. This allows source power into the RV. This does not disable the surge protection portion of the EMS.

**Modular Design:** Parts are designed for simple plug and play replacement, making repairs extremely user friendly

**Microprocessor Controlled:** The computer and remote display are driven by state of the art microprocessors that are programmed with software to drive the entire EMS. Should this software ever be changed EMS owners can receive a free upgraded processor with return of the old.

**Hardwired:** Semi permanent – Three Year Warranty - 9½"L x 5"W x 4½"D

**VIP Enterprises & Progressive Industries** are committed to making your RV experience easier and safer.

## **Models: EMS-HW50C**

### **Installation Instructions for Pedestal/Shore Power**

*See next page for both Pedestal and Generator Protection*

1. Unplug RV from the power source and be sure the generator is off.
2. Determine a location for the EMS control box and remote display. Make sure remote is within 13 feet of control box (length of supplied connecting cable).
3. Cut the RV power cord about 3¼ inches greater than the distance from the junction box to the desired location of the EMS control box. Then carefully remove 3¼ inches of the outer insulation on the input and output cables.
4. Strip back each conductor ¾ inch on both input/output ends.
5. Remove control box cover. Back off the six set screws from the top of contactor (relay). Remove the two ground screws and ring terminals located on the side of control box. Attach ring terminals to Green input and output wires.
6. Take your long cable, the one with the plug on it, and slide it into the input (L-1) side of control box. Then connect Black to L1, White to L2, Red to L3, and Green to ground screw. Torque down the screws to secure connections.
7. The short cable coming from the junction box connects to the output (T-2) in the same manner with the following exceptions. A) Insert the Black wire thru the current sensor with the green tape on it. B) Insert the Red wire thru the other current sensor. Make sure that the wire colors match across the relay from each other.
8. Double check all connections and make sure they are secure.
9. Secure cable end by tightening down strain relief's over outer jacket. Do not over tighten this could bite through insulation and cause a short.
10. Set time delay jumper on the circuit board. Factory setting is for 15 seconds, pull head of jumper (J6 on circuit board by remote display cable connection) to set for 136 seconds. See features section on time delay to determine which to use.
11. Attach control box cover with the six black machine screws provided. Input to input side.
12. Mount the EMS control box.
13. Install remote display and attach remote cable to control box and display.
14. Installation is complete. Next plug in and follow operation instructions.

## **Protection from both Generator and Source Power**

*Note: You will need a short piece of  
4 conductor, 6 gauge wire to complete this installation  
Read instructions completely before starting*

1. Unplug RV from the power source and be sure generator is off.
2. Locate transfer switch box. Remove cover from transfer box and remove the output cable. This cable will now be the output from the EMS control box.
3. Remove EMS control box cover. Back off the six set screws from the top of contactor (relay). Remove the two ground screws and ring terminals located on the side of control box.
4. Determine where the EMS control box and remote display will be mounted taking into consideration the output cable length.
5. Measure the distance between the transfer switch and the EMS control box input (L1 side) and add one foot. This is the length of cable that will be required for the installation. Make sure a 6-gauge 4-conductor cable is used.
6. Take jumper cable and strip back one end  $3\frac{1}{4}$  inches, and the other end the same as the end removed from the transfer box.
7. Strip back all conductors  $\frac{3}{8}$  inch. Attach ring terminals to green wires. DO NOT use ring terminal on any solid ground wire but instead make a ring with the solid wire itself.
8. Take the jumper cable with  $3\frac{1}{4}$  inch conductor strip, and slide it through the input side of the EMS control box then connect Black wire to L1, White wire to L2, Red wire to L3, Green to ground screw and tighten each set screw and ground nut.
9. The cable that was removed from the transfer switch connects to the output (T-1) in the same manner with the following exceptions. A) Insert the Black wire thru the current sensor with the green tape on it. B) Insert the Red wire thru the other current sensor. Make sure that the wire colors match across the contactor (relay) from each other. Cut back wires removed from transfer box to  $3\frac{1}{4}$  inches if needed.
10. Connect the loose end of the jumper cable to the transfer switch. See wiring diagram on the transfer switch if needed.
11. Double check all connections and make sure they are secure.
12. Secure cable ends by tightening down strain relief's over outer jacket. Do not over tighten. This could bite through insulation and cause a short.
13. Set time delay jumper on the circuit board. Factory setting is for 15 seconds, pull head of jumper (J6 on circuit board by remote display cable connection) to set for 136 seconds. See features section on time delay to determine which to use.
14. Attach EMS cover with the six black machine screws provided. Input to input side. Fasten transfer switch cover.
15. Mount EMS Control Box and remote display in desired locations.
16. Install cable to remote display and EMS control box.
17. Installation is complete. Plug in and follow instructions.

## Operating Instructions

1. Plug into source power.
2. The digital display will read 888 for two seconds then begin scrolling the voltage, amps, line frequency, and error code. In addition the time delay light will flash (dot in the bottom right corner). If the dot does not flash a line fault condition is present check error code (see below or your supplied code card).
3. You may notice when first plugging in that the display may read E-9, don't worry about this, it only means that the display has not gotten data from the computer yet. By the next cycle through it should read E-0 if the source power is normal.
4. The meter will read L-1, and then give you a three digit number that is your line one voltage. Then 0A, that is line one amps (current). After that L-2, a three digit number, that is line two voltage. Next 0A, which is line two amps. Amps will read zero until the time delay is complete. Afterward you will notice a current (amps) reading between 0 and 35. That number indicates how many amps the RV is drawing on each line. Following, you will notice a number 60H, which is your line frequency. That number should remain fairly consistent, however it may read +/- one or two. Last, you will notice the E code, E0 is normal, only if E0 is present will the time delay light flash and the EMS bring power to the RV.
5. Verify that error code E0 is displayed and set up is complete.

**Note:** If the wiring reads anything different than correct the EMS will not turn on and we recommend moving to a different source or use generator power. Also if power is below 104 volts or above 132 volts the EMS will not turn on. We recommend using generator power.

**Important:** The display reads voltages between 78 and 260 volts. Below will read LLL, above will read HHH.

### Error Code Chart

- E-0 -- Normal condition
- E-1 -- Reverse polarity condition (hot and neutral wires reversed)
- E-2 -- Open Ground (no ground wire connection)
- E-3 -- Line 1 Voltage High (line 1 voltage above 132)
- E-4 -- Line 1 Voltage Low (line 1 voltage below 104)
- E-5 -- Line 2 Voltage High (line 2 voltage above 132)
- E-6 -- Line 2 Voltage Low (line 2 voltage below 104)
- E-7 -- Line Frequency High (line frequency above 69 cycles per second)
- E-8 -- Line Frequency Low (line frequency below 51 cycles per second)
- E-9 -- Data Link Down (remote display not getting information)
- E-10 Replace the surge protector module

**Note:** *An open neutral will cause there to be **no** reading on the display*

Note: If the EMS cuts the power to the RV it will show a PE (previous error) code following the E code. This denotes the previous error or why the EMS shut down power. Example: The EMS cut power for low voltage on line 1 then power comes back up and is restored. The error code reads E0 (good electricity now) but the PE code reads PE4, that tells the user low voltage line 1 was the reason the EMS previously cut power.

When power is first applied to the RV you may notice a large current draw on the amp meter even though little or nothing in the RV is turned on. This is caused by the battery charger built into the RV. Less current will be drawn as the batteries become charged. However this may take some time depending on how low the battery voltage was.

# Troubleshooting Guide

## Common Installation Mistakes:

1. Check remote display cable connections by unplugging and re-plugging to ensure a good connection.
2. Unplug power source, open EMS control box and check connections. Look at the small wires located under the input connections, and make sure the conductor colors match (small black wires and black RV input wire, small red wires and red RV input wire, and small white wires with white RV input wire). If you have wired the input wires incorrectly, rewire to match the small wires.
3. Make sure that input wires are in fact the input wires, connecting the output to the input of the EMS will result in the device not functioning.
4. If the EMS is still not functioning at this point follow instructions below prior to calling technical support.

### **Write down the following information prior to calling technical support:**

1. Look at the computer board located on the side of the EMS control box. You will notice a red light, this should be on. If the light is not on stop there and call technical support. If the light is on go to next step.
2. Look at the display, if no reading is present call technical support. If the display is reading information note the error code message. If the EMS is reading Error 1-8 see error code chart on previous page, this means the EMS is functioning fine. However, if it is reading E9 call technical support. If reading E0, read on.
3. Look to see if the time delay indicator (located in the bottom right number) is flashing. Wait out time delay. When you see the indicator stop flashing power should come on in the RV. If not there is a bypass switch located on the face of the display, push it up. Power should be on in RV. If it is not on call technical support. **Note**, leaving the unit in bypass does indeed bypass the electrical protection.

**Technical support can only help if the above information is provided.  
Therefore please do not call until the above information is obtained.**

### **To recap**

- Are the connections right?
- Is the red light located on the circuit board inside control box on?
- What error code message is being displayed?
- Is the delay indicator flashing?
- When the bypass switch is switched on the remote display does power come on in the RV?

Technical support – 919-462-8280

## **Progressive Industries Warranty**

Progressive warrants its products are free from defects in materials and workmanship for a period of three years. This is in lieu of all other warranties, obligations, or liabilities expressed by the company. In the event that a properly installed EMS proves defective under normal use, Progressive will repair or replace the device at its discretion.

With the Hardwired EMS it is not necessary to return the entire system for repair. This product was specifically designed to be modular. Therefore, any part of the EMS can be replaced without removing the entire product. For technical support call 919-462-8280.

Once technical support has properly diagnosed the problem, if any, they will send you a replacement part. Do not remove damaged part unless instructed to do so; this will aid you when it comes time to installing the replacement part.

When you receive your replacement part or parts, inside the box will be a return address label with RGA number, simply use the same box, and return label to ship back the damaged part.

The address below is strictly a mailing address. Please do not try, or attempt to visit our facility during business hours. The company is not properly staffed or equipped to handle on site repair work. All returns must go through technical support.

**Progressive Industries  
1381 Kildaire Farm Rd PMB 281  
Cary, North Carolina 27511**

**The unit should be properly packaged, with the postage paid and the following information:**

1. Date of purchase
2. A detailed explanation of the defect.

Progressive cannot assume responsibility for acts of God, alterations, shipping handling or any other factors not under the control of Progressive Industries.

Progressive has no responsibility for installation, personal injury, property damage, incidental, contingent, or consequential damages of any kind resulting from defects or failure of the unit to function.

The remedy for breach of this warranty is limited to the repair or replacement of the defective product at Progressives option. In no case shall the liability prescribed by law exceed the purchase price. Some states do not allow exclusion or limitation of incidental or consequential damages or allow disclaimer, modifications, or limitations on how long a warranty last, therefore the above warranties may not apply to you. This warranty gives you certain legal rights, and you may have other rights, which may vary from state to state.