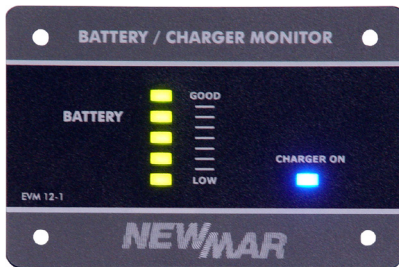


# Emergency Vehicle Battery/Charger Monitor

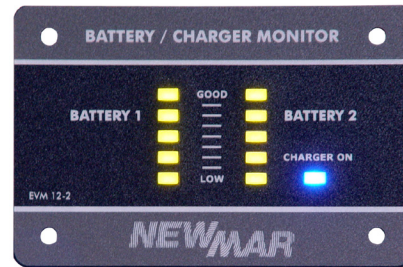
## Models:

**EVM-12-1; Single Battery Bank Display**

**EVM-12-2; Dual Battery Bank Display**



EVM-12-1



EVM-12-2

## Installation/Operation Instructions

The EVM-12 meter series is a smart, 12 volts DC bar graph monitor, that provides a charger and battery state of charge indication. The EVM-12-1 is a single battery bank monitor. The EVM-12-2 is identical except it displays and monitors two battery banks. The EVM-12-1 and EVM-12-2 can be directly connected to the EV-40 charger. Models PT-14, PT-25, PT-40 and PT-80 chargers can also be used with model EVM meters, however; the "Wire Interface Assembly EVM" (part number 023-5300-0) must be used for installation.

### I Parts Required

22 gauge interconnect wire is required to connect the meter panel to the charger interface box (PT charger) or EV-40 charger. This cable is available for purchase from NEWMAR, part number 712-2205-0 (available by the foot), or any jacketed 22 gauge cable will work (EVM-12-1: 3 conductor, EVM-12-2: 4 conductor). A cut-out saw and drill are required to complete the installation along with some hand tools.

### II Before Installation

Remove AC and DC power from the battery charger before attempting to make any connections; this will prevent any shorting and accidental damage to the charger, wiring, and the EVM-12 monitor.

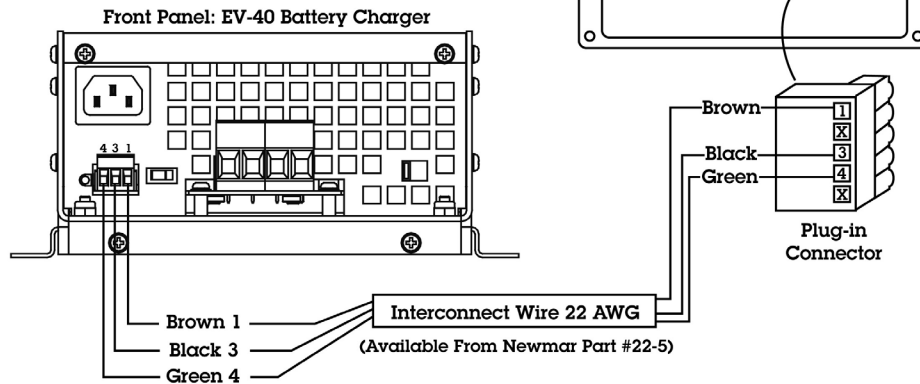


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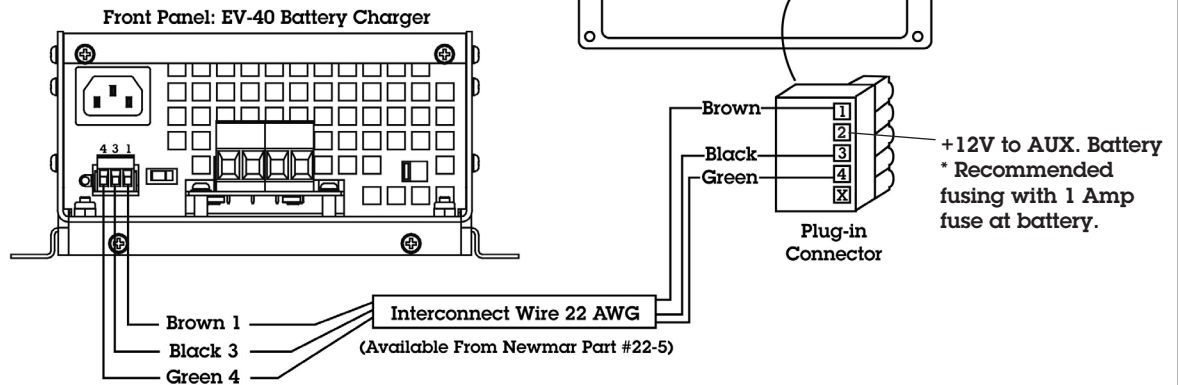
### Single Battery Bank

## SYSTEM WIRING DIAGRAM EV-40 BATTERY CHARGER FIGURE 1



### Dual Battery Bank

## SYSTEM WIRING DIAGRAM EV-40 BATTERY CHARGER FIGURE 2



### EV-40 Installation

Locate a visible place to mount the meter panel, front panel of meter is waterproof so it is ok to install in an area exposed to the weather. Refer to Figure 4 (last page of manual), for the proper cut-out dimensions for the meter panel; a diagram is provided for making the proper cut-out and holes.

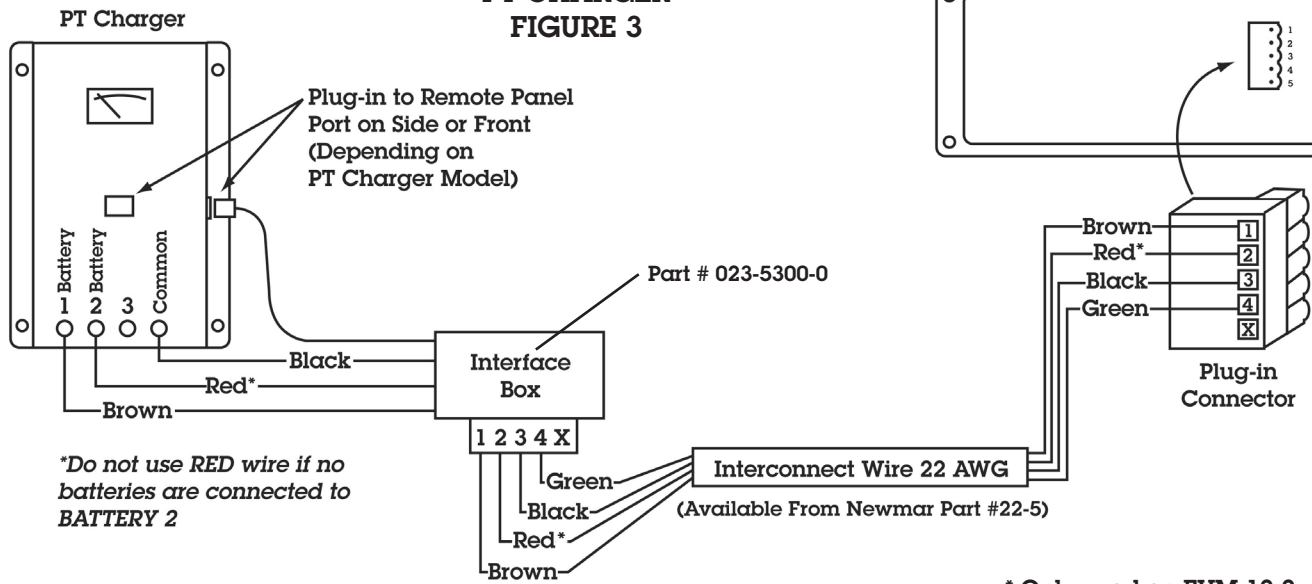
Next, route the wire directly from EV-40 charger to the meter panel cutout. The connector on the back of the meter has a plug-in jack which can be removed to ease the mating of the connection. Strip the ends of your interconnect wire and secure the to the terminal block observing the color/terminal position for all installations. Note screw terminal #5 is unused as shown in Figure 1 & 2. For a dual battery bank installation with the model EVM-12-2, connect a wire (22 AWG) from meter connector or terminal #2 to the positive (+) battery post of Bank #2. We recommend fusing this wire for protection (1 Amp fuse). Plug the jack into the panel meter connector, and mount using sheet metal or machine screws with nut and lock washer.

Note: If the meter panel is in an exposed area, apply a bead of silicone to the flange underside of the panel, (see Fig. 1 or 2) to prevent water intrusion behind the pane. Reconnect AC power to the charger, this completes the installation.

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## SYSTEM WIRING DIAGRAM PT CHARGER FIGURE 3



### PT Charger Installation Only: Installing the Battery Charger Monitor Wire Interface Box

Locate a visible place to mount the meter panel, front panel of meter is waterproof so it is ok to install in an area exposed to the weather. Refer to Figure 4 (last page of manual), for the proper cut-out dimensions for the meter panel; a diagram is provided for making the proper cut-out and holes.

Next, route the interconnect wire from the interface box to the meter panel cutout. The connector on the back of the meter has a plug-in jack which can be removed to ease the mating of the connection. Strip the ends of your interconnect wire and secure the to the terminal block observing the color/terminal position for all installations. Note screw terminal #5 is unused as shown in Figure 1 for PT installations. Plug the jack into the panel meter connector, and mount using sheet metal or machine screws with nut and lock washer.

Note: If the meter panel is in an exposed area, apply a bead of silicone to the flange underside of the panel, (see Fig. 3) to prevent water intrusion behind the pane. Reconnect AC power to the charger, this completes the installation.

Select a suitable location within 18" of the PT charger, and mount the box using the screws provided. Route the interface cables to the charger, and connect the ring terminals to the charger's +1, +2, and common output posts as shown in Figure 2. Note, Do not connect RED wire to charger bank #2 if no batteries are connected to bank #2 - clip off this un-used ringlug. Insert the RJ-11 phone plug into the jack labeled "RP" on the side of the charger or front panel (depending on model) and ensure it clicks in place. Next, strip 1/4 inch of insulation from your interconnect wire and insert into the screw terminals on the side of interface box following the suggested color code shown in Figure 3, and tighten the screws securely. Note terminal screw position # 5 is unused.



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## II) Operation

### **A) Battery and Charger Status Indicators**

The EVM-12 panel enables you to monitor when the charger is on and the batteries' state of readiness at a glance. Red, orange, and green bar LEDs indicate the batteries' state of charger, and a blue 'Charger On' LED is illuminated whenever AC power is connected to the charger. Flashing red bars indicate when High or Low voltage is detected. The display has a sleep mode to conserve power, and gives periodic flashing indication of the battery voltage level even when the vehicle engine and charger are off. In the event battery voltage drops to a critical level, the display will automatically come out of sleep mode into full operation to alert the operator.

Battery status bar graphs operate as follows: With a fully charged battery, all five green bars will be lit indicating a battery voltage of over 13 volts. As the battery discharges, the green bars will go out one at a time until three remain lit, which is about 12.4 volts. As the state of charge drops further, the bars will change to orange, indicating the battery is getting low, which is below 12.4 volts. As the voltage of the battery drops lower, orange bars will illuminate. Once the battery is nearly discharged, the orange bars will go out and one red bar will remain illuminated. As the voltage continues to drop further, one red bar will begin to flash, indicating the battery is discharged to 11.2 volts and should be re-charged as soon as possible.

In the event that the battery voltage goes too high, over 15 volts, the entire 5 red segments will flash red to indicate an over voltage condition. If this should occur while the vehicle's engine is in operation, it's possible there is a fault within the alternator/charging system. This can be checked by shutting off the vehicle's engine and observing if the battery status upper red bars quit flashing. If an over voltage indication is observed when the vehicle's engine is not running disconnect power from the battery charger and observe the panel to verify that the blue 'Charger On' LED is out and the upper red LED bars have quit flashing and are now green. If so, the battery charger's output voltage should be tested to insure it is correct for the battery type selected.

### **B) Time-Out Feature/Sleep Mode**

To conserve battery power, the EVM-12 has a time-out feature called 'sleep mode' which activates after a period of 48 hours if the charger and/or the vehicle is off and either battery voltage is below 13 volts. The meter will automatically come out of sleep mode whenever either battery(s) voltage is above 13 volts. When the meter is in the sleep mode, the LED segments will blink once every 2-3 seconds. The LED's which blinks also indicates the voltage level of that battery. Therefore, it is possible to monitor the battery voltage even in sleep mode. Sleep mode reduces battery current drain. In the event that battery #1 or battery #2 voltage drops below 11.9 volts, the display will come out of sleep mode and the LED segment will illuminate to indicate the battery's state of charge. If low battery condition is noticed, the battery should be re-charged as soon as possible

### C) Start-Up Sequence Mode

The EVM cycles through a test mode when power is applied. The blue 'Charger On' LED will rapidly flash and each segment of both bar graphs will light up sequentially starting from the bottom red bar, then changing to all yellow at the second LED, and then changing to all green up to the fifth bar.

Finally, all LED segments will change to flashing red, and then normal operation begins. As an option, test mode can be initiated and the display reset by installing a momentary switch (normally closed) in line with battery #1 sense wire. When the switch is pushed, it will interrupt power to the meter which initiates the test mode and resets the meter. This can be used to take the meter out of sleep mode, if so desired.

### III) Specifications

#### Electrical:

Input Voltage: 9-16 VDC (12 VDC vehicle battery systems), Negative Ground

Battery Bank Monitoring Capacity:

EVM-12-1: One Battery Bank

EVM-12-2: Two Battery Bank

Meter Calibration Key
All 5 bars flash RED > 15V
All 5 bars GREEN between 13-15V
3-4 bars GREEN between 12.2 - 13.0V
2 bars YELLOW between 11.8 - 12.2V
1 bars RED between 11.2 - 11.8V
1 flashing RED < 11.2V

#### Mechanical:

Case Size: 4.75" W x 3.125" H x 0.72" D" (with connector)

Display case front: Waterproof

### D) Technical Assistance

If you have any questions about the proper operation of your meter, please contact NEWMAR's Technical Assistance:

Phone: 714-751-0488 - From the hours of 7:30 a.m to 3:30 p.m. weekdays, P.S.T. - Fax: 714-957-1621 - Anytime

E-mail: [techservice@newmarpower.com](mailto:techservice@newmarpower.com) - Anytime

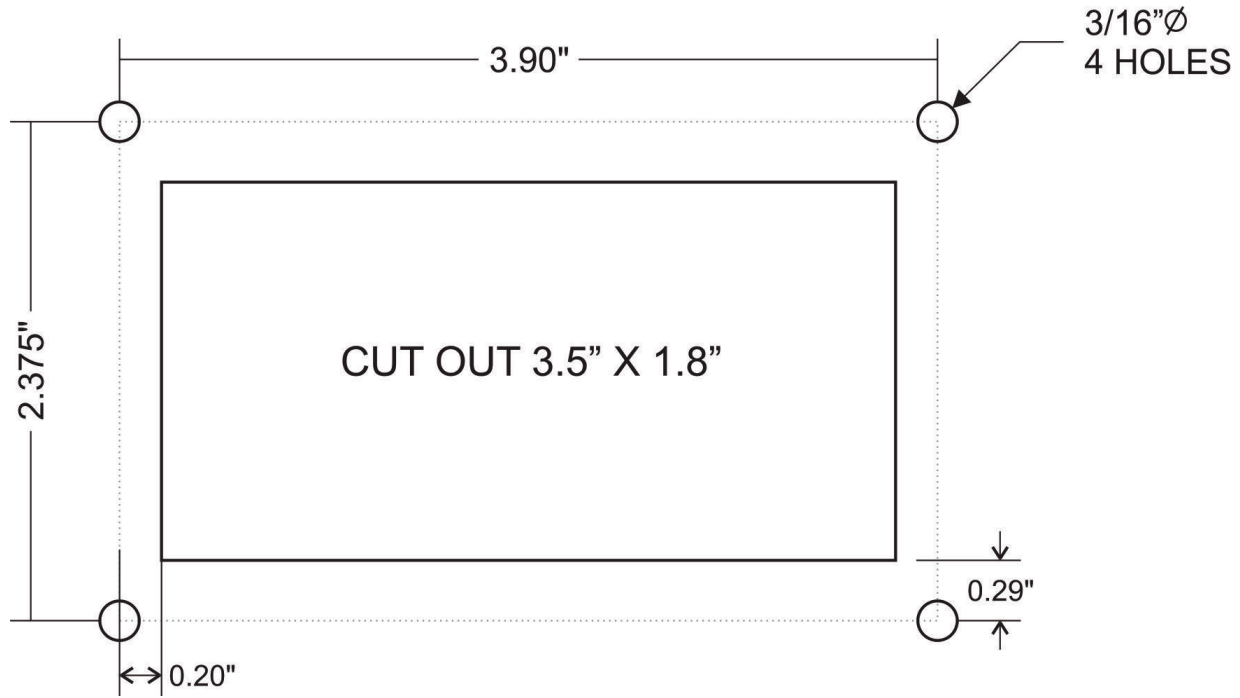
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EVM-12-1 & EVM-12-2 Mounting Diagram: Figure 4



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