

## Warranty

This warranty is only for components of the Total Coach System supplied by SilverLeaf Electronics, Inc. It does not cover any other components from other manufacturers that may be monitored or controlled by the system. Those products may be covered by a warranty by their respective manufacturers.

The obligation of SilverLeaf Electronics, Inc. under this warranty shall be limited to repair or replacement (at our option) during the warranty period of any part which proves defective in material or workmanship under normal installation, use, and service, provided the product is returned to SilverLeaf Electronics, Inc.. The warranty period shall be one year from date of purchase of the unit, or purchase of the finished coach with the unit installed.

This warranty shall be invalid if the product is damaged as a result of defacement, misuse, abuse, neglect, accident, destruction, alteration, improper electrical voltages or currents, repair or maintenance by any party other than SilverLeaf Electronics Inc. or an authorized service facility, or any use violative of instructions furnished by us.

This one-year warranty is in lieu of all other expressed warranties, obligations, or liabilities. Any implied warranties, obligations, or liabilities, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, shall be limited in duration to the one-year duration of this written limited warranty.

In no event shall SilverLeaf Electronics, Inc. be liable for any special, incidental, or consequential damages for breach of this or any other warranty, expressed or implied, whatsoever.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



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## Total Coach System™ for Country Coach Users Manual



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## Overview

The Total Coach System™ as installed by Country Coach consists of the following elements supplied by SilverLeaf Electronics.

### *Total Coach Monitor*

This is the “control center” of the system. This multipurpose monitor allows the user to monitor and control most functions of the Total Coach system. In addition, the VMS 200 EL or CompuDigital Dash also serves to monitor and control the system. The two monitors are completely compatible, and actions initiated by the user on one display will be reflected in the other.

The Total Coach Monitor is generally located in the living area of the coach.

### *TM-101 Sensor Manager*

The TM-101 is located in the basement of the coach, near the holding tanks. This small black box is connected to the tank sensors, temperature sensors, water pump, fresh fill relay, and other discrete system components.

### *PM-002 Power Manager*

The PM-002 is usually located in the shift console of the coach, and is connected to the generator, inverters, and Surgeguard transfer switch. The PM-002 monitors and controls these products, and also includes the logic for starting and stopping the generator for battery charging and other purposes. The PM-002 can operate regardless of whether the Total Coach Monitor is on or even connected - the monitor is used only for user feedback and configuration.

In addition, the system integrates products from other vendors, including:

### *Onan QD Generator*

The generator is controlled through a special “node” located near the PM-002.

### *Xantrex Prosine Inverter*

The system can control up to two inverters. Data from the inverter is used to trigger the battery Autocharging feature, as well as for user feedback.

### *Surgeguard Automatic Transfer Switch*

Besides protecting the coach from surges, cross wiring, and other forms of bad AC power, the Surgeguard also provides data on AC condition and usage.

Please consult the appropriate manuals for more information on these products.

## Generator Mode

The Generator mode shows the status of the generator, including run time, temperatures, load, and faults. Holding the GEN key for a second starts or stops the generator as desired.



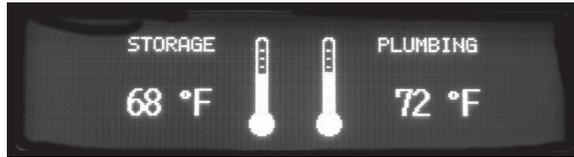
## GenStart Mode

The START mode allows the user to set the parameters for the automatic genstart system, including the Autocharger (automatic battery charging) and Exerciser (scheduled running). For details, consult the Total Power Management Manual.



## Temperature Mode

This mode shows the temperature of the storage bay and the plumbing bay.



## 120V Mode

This mode shows the status of the Surgeguard transfer switch, which in addition to monitoring the amperage and voltage of the AC system, also protects against various types of bad power. If the coach is connected to a power source which is mis-wired, has too much or too little voltage, or suffers from any one of a number of problems that could damage the appliances in your coach, the Surgeguard will intercept the problem and the monitor will display the problem here.



## Inverter Mode

The Inverter mode shows the input and output amperage and voltage from the inverter (or inverters), and also allows the user to turn on or off the inverter or charger, and adjust the maximum charging amperage. This last feature is important when working with a shore hookup with less than 50 Amp service. If the charger is at full amperage and the batteries are low, then the amperage draw may leave little or nothing left for the rest of the coach, and a tripped breaker will result. By reducing the charger draw, more power is available for the rest of the appliances, although the batteries will take longer to charge.

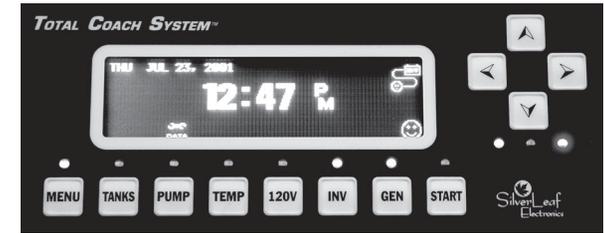


Holding the 120V key for a second will turn the Inverter on or off. Holding the INV key for a second will do the same for the charger. The only reason to turn either unit off is to reduce the small battery drain. The inverter in particular should be turned off if the coach is being placed in storage or is being left for several days. The charger should generally be left on.

## Using the Total Coach Monitor

### Navigating the Display

The Total Coach Monitor consists of a large graphic display, eight “Mode” keys, and four “Navigation” keys. Pressing a Mode key will cause the display to show information relevant to that particular key. Once in a particular “mode”, the navigation keys are used to select and change particular items in that mode.



For example, pressing “Start” causes the unit to display information on the automatic generator start system. Once in this “mode”, the navigation arrows allow the user to adjust the many settings relating to the genstart.

### Idle and Sleep Mode

If the unit is already in a particular mode when that mode key is pressed, it reverts to the “Idle” mode. In this mode the unit shows a clock and calendar, plus a series of icons showing the general state of the system. An example is shown above.

If any errors are detected in the system, an icon will appear near the bottom of the screen. These icons include indicators for such items as low fresh tank or LPG level, high waste tank levels, bad AC input, and faults for the inverter or generator. A “happy face” icon will show that no faults are currently active.

Near the top right will appear an icon showing whether AC power is available from the shore cord, generator, or inverter.

The display will automatically go to “sleep” after several minutes of no activity. While “sleeping” the display will be blank, but the unit will continue to monitor all systems, and the LEDs will continue function. Pressing any key will awaken the display.

### Reading the LEDs

Near the Navigation keys are three LEDs (small lights) which indicate the presence of an error. The Green LED indicates no errors are active. The Yellow LED indicates an error that is easily correctable, such as full or empty tanks. The Red LED indicates a more serious error, such as a problem with the generator or inverter.

Each Mode key also has a small green light, or LED. If the LED is on, and not blinking, it indicates that an associated accessory, such as the water pump, generator, or battery charger, is running. If it is flashing, it indicates an error, and pressing that key will generally reveal the specifics.

The following table indicates the meaning of each LED state:

Key	Solid	Flashing
MENU	N/A	Communications Failure
TANKS	Fresh Tank AutoFilling On	Tank Near Full/Empty
TEMP	N/A	Plumbing Bay Near Freezing
PUMP	Water Pump On	N/A
120V	AC Power Available (Shore or Gen)	Incoming AC Power Bad
INV	Charger On	Inverter Fault Detected
GEN	Generator On	Generator Fault Detected
START	Genstart Has Turned on Generator	Genstart Fault Detected

### Long Keypresses

Holding down a mode key for more than about one second generally triggers some specific action in the system, in addition to bringing up the appropriate mode. The following table shows the actions performed:

Key	Action
MENU	Allow date/time setting.
TANKS	Start automatic fresh water fill.
PUMP	Turns on/off water pump.
120V	Turns on/off charger.
INV	Turns on/off inverter.
GEN	Starts/stops generator.
START	Starts/stops generator.

### Getting Help

Pressing the MENU key brings up a “Help” mode which explains most of the features of the monitor.

### Setting the Clock/Calendar

Holding the MENU key for a second brings up a mode which allows the user to set the date and time.

### Tank Levels

Pressing the TANKS key brings up the Tank Mode which allows the user to read the levels for the Fresh, Gray, Black, and (if present) LPG tanks. The unit shows a bar graph showing each level, and also shows a numeric value for each one in turn. The navigation keys allow the user to scan through the values faster.

### Automatic Fresh Water Fill

Holding the TANKS key for a second starts the Automatic Fresh Water Fill feature. This feature diverts water from the shore input into the fresh water tank, stopping when the tank is nearly full. As noted below, the coach should be level before starting this procedure. To stop the process before the tank is full, press the key again for about one second.

#### A Note on the Limits of the Sensor Technology

The Total Coach System uses pressure sensors at the bottom of each tank to read the water level. These sensors are very precise, and cannot be fouled by ordinary waste materials. However, it is important to realize that to get an accurate reading the coach must be level. The sensors are even accurate enough to detect changes due to fluctuations in the air leveling system. Thus some drift in the readings is normal, and is the tradeoff implicit in having a more precise measuring system.



The user should also be aware that “empty” is not precisely empty, nor “full” completely full, but that there is a certain amount of extra room deliberately programmed into the system. There is also some variation from coach to coach in the mounting of the tanks and other factors that affect the sensor accuracy. While the system is calibrated at the factory, the user may wish to fine-tune the settings, and this can be done through the VMS or Digital Dash in the cockpit.

### Pump Mode

The Pump mode shows the status of the Water Pump and Fresh Fill valve. It also shows the Fresh Tank level, and shows any error associated with these systems.



Note that the pump can also be controlled by switches mounted elsewhere in the coach. Those switches are tied to the Total Coach System, and they have exactly the same effect as holding the PUMP key for about one second.