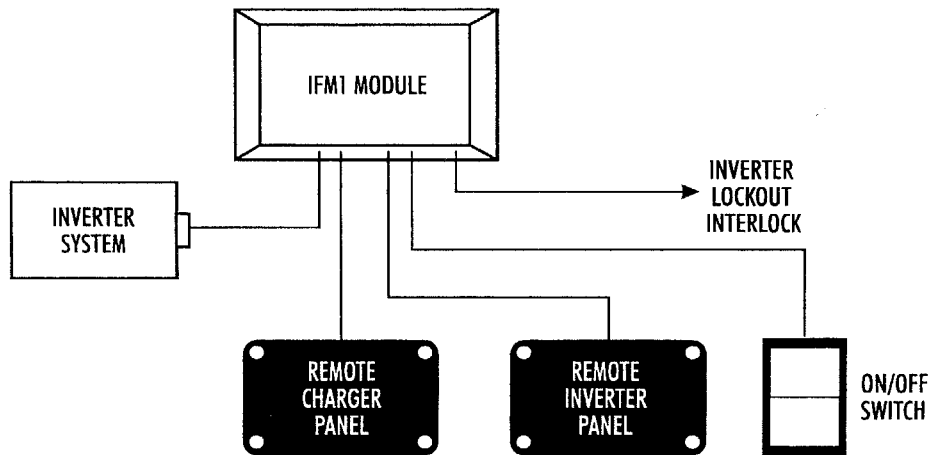


VANNER POWER GROUP

OWNER'S MANUAL



IFM1 Inverter Remote System

OM/A96752 REV. A

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Icon Legend



Note



Warning

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1-800-AC POWER

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Section 1: General Information

Thank you for purchasing the IFM1 Inverter Remote System. Vanner products are designed and manufactured by skilled professionals, using the highest standards of workmanship. With minimum maintenance and care, you can expect many years of trouble-free service from your Vanner IFM1 Inverter Remote System.

**NOTE**

The IFM1 Interface Module is required for status panel use.

The IFM1 Inverter Remote System is a modular set of Vanner products based upon the IFM1 Interface Module (Vanner Model IFM1). The primary application for this system is for emergency vehicles, e.g., ambulances that must meet Federal specification KKK-A-1822D. The IFM1 Inverter Remote System is designed to be used with Vanner emergency vehicle inverter models 20-1050CUL and 20-1000TUL (new version). Note that this system may also be used with the following Vanner products: Bravo 710, Bravo 1050, and Bravo 1800.

Depending on the remote system configuration purchased, your system will be comprised of a Vanner inverter, an IFM1 Interface Module, and a selection of the following optional products:

- Remote Power Inverter Indicator Panel (p/n D06638)
- Remote Charge Indicator Panel* (p/n D06639)
- Remote System On/Off Switch Assembly—Rocker Switch and 8 ft. cable (p/n D06781)
- Remote Switch Adapter** (p/n D06625).

* Used only with inverter power systems with battery charger option.

** This adapter is used on vehicles wired for older Vanner inverter models 20-1000UL, 20-1000TUL, 20-1000, and 20-1000T, that have the Remote Switch with the Cinch 4-pin plug (two different versions). The adapter contains a Cinch socket and pigtail for wiring it to the IFM1 Interface Module.

Section 2: Installing the IFM1 Interface Module

Unpacking the Interface Module

Inspect the shipping container and equipment for loose or damaged parts. The container should consist of the IFM1 Interface Module, the 2 ft. Interface Cable, and Installation Instructions. If any damage is found, immediately notify the freight carrier.

Installing the Interface Module

Step 1: Mount the Interface Module into the vehicle's electrical system with #8 screws with the electrical contacts facing downward or sideways. Select a physical orientation best suited for your application environment, this should be as close to the inverter as possible since the interface cables is 2 ft. in length.

Step 2: Install the 2 ft. Interface Cable by plugging one end into J1 on the IFM1 Interface Module and the other end into the RJ-11 jack on the inverter labeled "Remote."

The Interface Module is now ready for wiring to the selected remote options.

Section 3: Installing the Remote System On/Off Switch

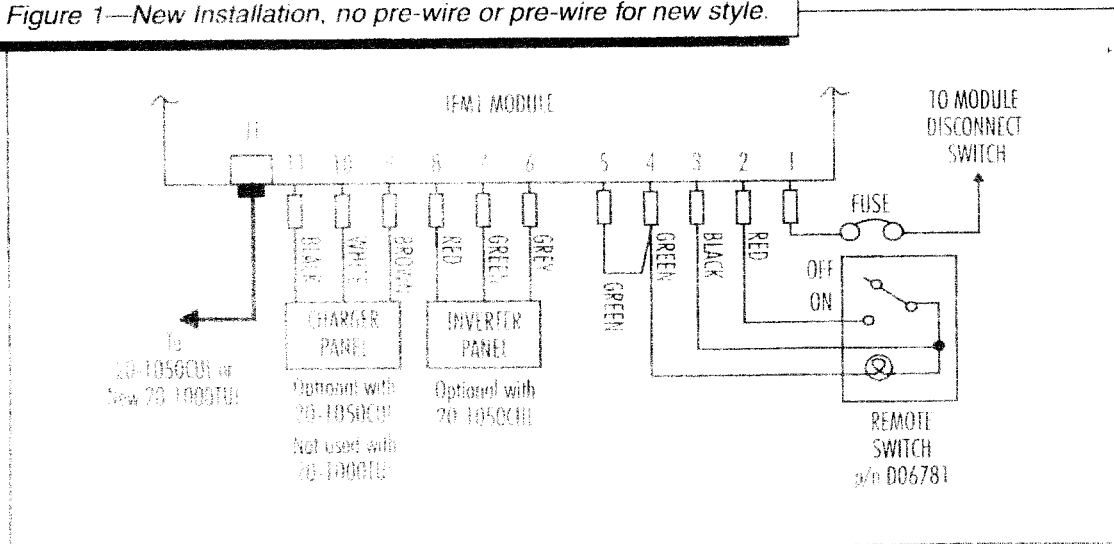
There are five possible options for remotely turning the inverter On and Off.

1. Vanner Remote System On/Off Switch Assembly—Rocker Switch and 8 ft. cable (p/n D06781).
2. Existing Vanner Remote Switch (Vanner p/n B03409) with Cinch plug.
3. Existing Vanner Remote Switch with (Vanner p/n 02014) Cinch plug .
4. OEM or user supplied remote switch.
5. Ground control method.

The Vanner Remote Switch Adapter (p/n D06625) greatly simplifies the wiring of the remote switch if the vehicle has been pre-wired for another model Vanner Inverter or if you are replacing an old Vanner Inverter. The existing Remote Switch simply plugs into this adapter.

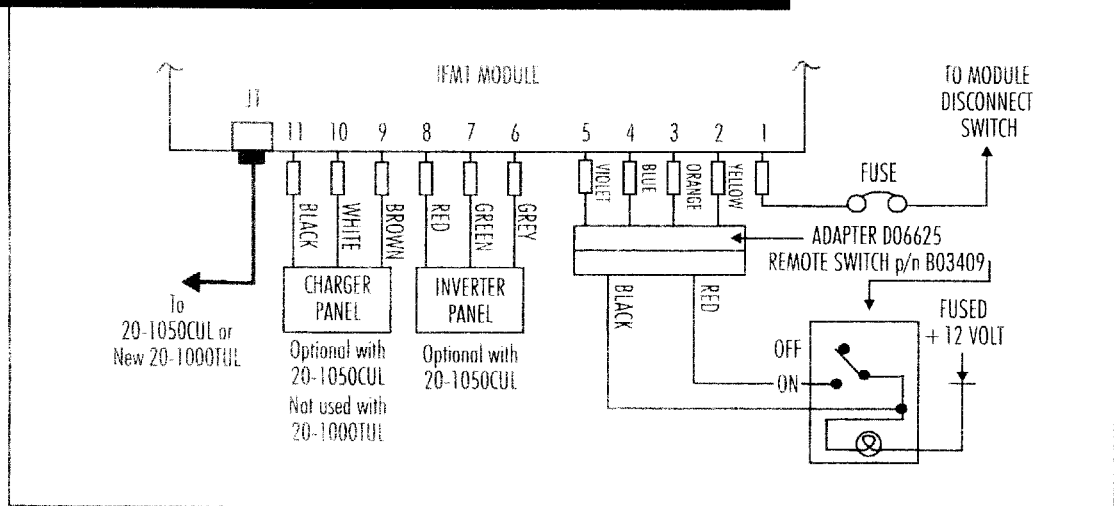
Option 1: This is a "new installation" where the inverter is placed in a vehicle that does not have an inverter and is not pre-wired for an inverter (refer to figure 1). These instructions should also be used if the installation uses the new style remote switch assembly. In this installation the remote switch wires are routed to the IFM1. The four color coded wires of the remote switch wiring harness plug into the IFM1 terminals 2, 3, 4, and 5. The red wire connects to terminal 2, the black wire connects to terminal 3, one green wire connects to terminal 4, and the other green wire connects to terminal 5.

Figure 1—New Installation, no pre-wire or pre-wire for new style.



Option 2: This installation is for situations where the vehicle has been pre-wired for the 20-1000UL or the older style (1988-1996) 20-1000TUL (refer to figure 2). These vehicles have the remote switch installed by the chassis manufacturer. One terminal of the switch does not connect to a harness wire. This one switch terminal is supplied +12 volts from the chassis. The switch has a two wire harness that terminates with a 4-pin Cinch connector. Instead of removing the remote switch and reinstalling the new style it is easier to use the Remote Switch Adapter (p/n D06625). The adapter has four colored wires that plug into IFM1 terminals 2, 3, 4, and 5. The yellow wire connects to terminal 2, the orange wire connects to terminal 3, the blue wire connects to terminal 4, and the violet wire connects to terminal 5.

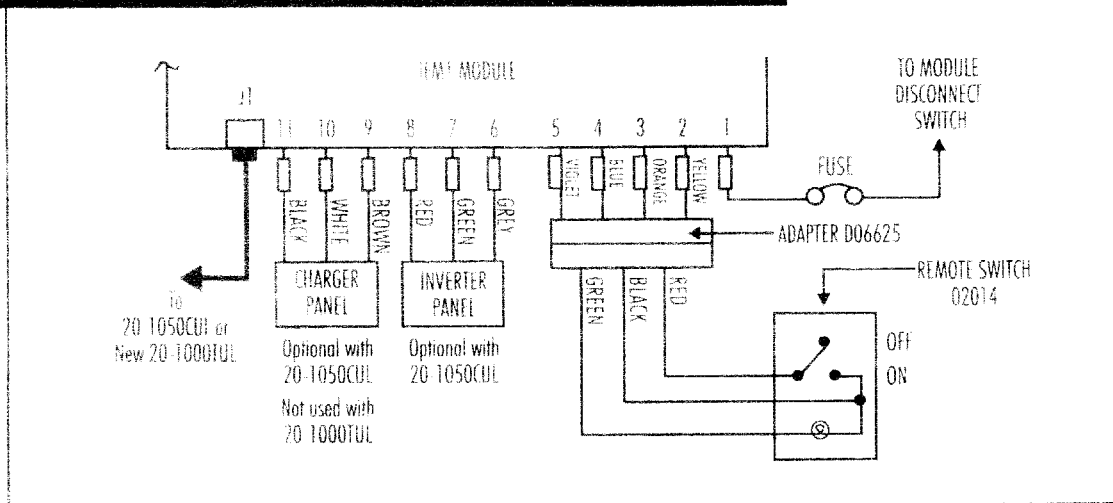
Figure 2—New Installation, or retrofit on a vehicle pre-wired for older style (1988 to 1996) Vanner UL Listed 1000 Watt inverters 20-1000UL & 20-1000TUL.



Option 3: This installation is for situations where the vehicle has been pre-wired for the older remaining Series 20 Vanner Inverters (20-1000, 20-1000T, 20-2200PE, 20-2200TPE, etc.) (refer to figure 3). These vehicles have the remote switch installed by the chassis manufacturer. The switch has a three wire harness that terminates with a 4-pin Cinch connector. Instead of removing the remote switch and reinstalling the new style it is easier to use the Remote Switch Adapter (p/n D06625). The adapter has four colored wires that plug into IFM1 terminals 2, 3, 4, and 5. The violet wire connects to terminal 2, the blue wire connects to terminal 3, the yellow wire connects to terminal 4, and the orange wire connects to terminal 5.

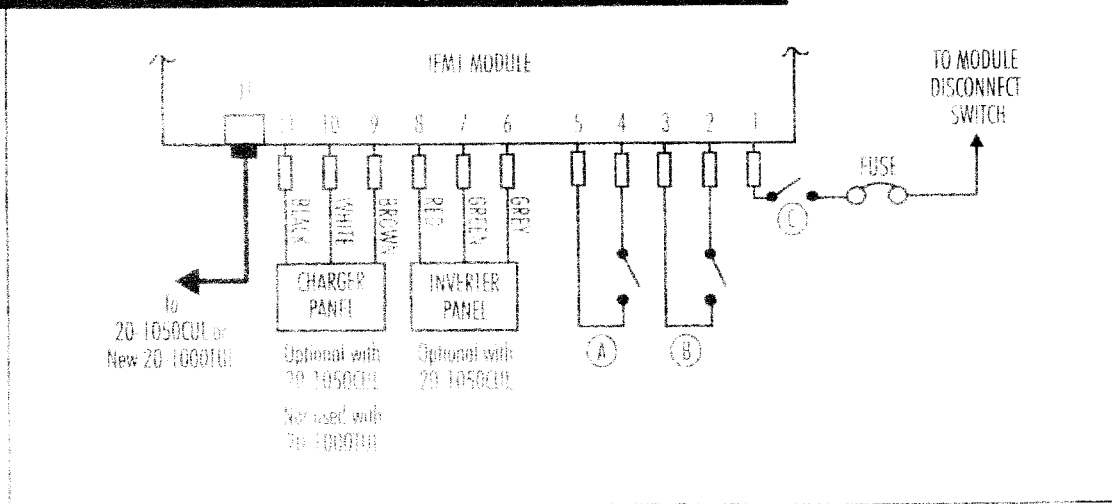
Additionally, there is a DC Cable Adapter (p/n D06623) available to allow the gray DC connector to attach to the blue DC connector, already installed in the vehicle.

Figure 3—New installation or retrofit on a vehicle pre-wired for non-UL listed series 20 Vanner inverters. (20-1000, 20-1000T, 20-2200PF, and 20-2200TPF)



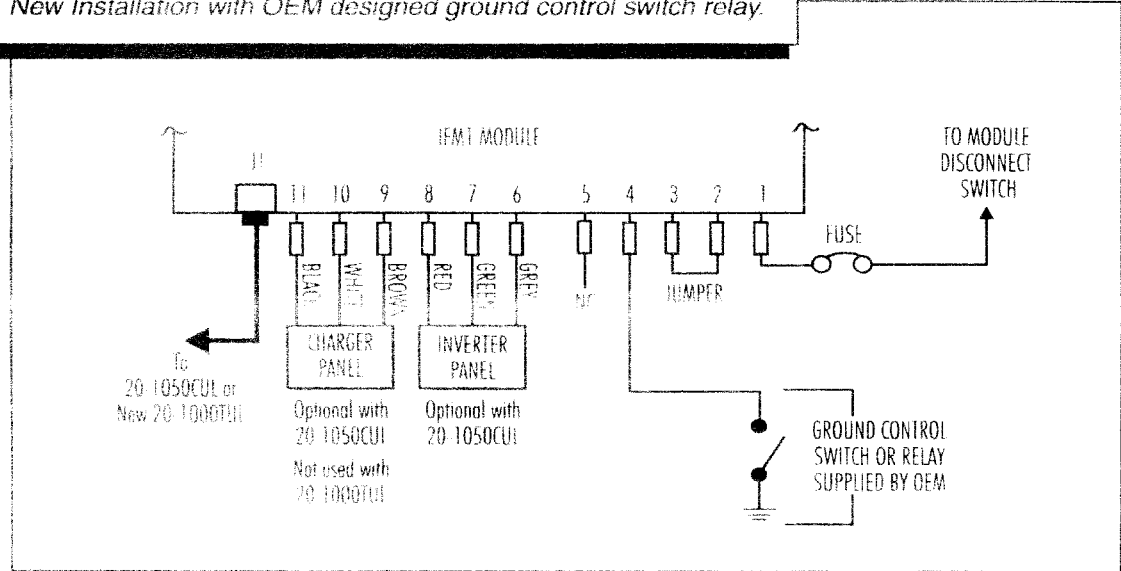
Option 4: The fourth remote switch situation has the OEM or user supplying the remote switch (refer to figure 4). A switch or relay contact can be used in any of the three locations (A, B, C) shown in the following diagram. As shown, all three switches would need to be closed to activate the inverter. When one switch is in place, use jumpers to simulate the other two closed switches. (Call Vanner Technical Support to verify compatibility).

Figure 4—Three possible remote switch locations.



Option 5: The fifth remote switch situation is a Ground Control Method (refer to figure 5). This allows the OEM engineers to simply provide a ground through a switch, relay contact or power transistor to Pin 4 or the IFM1. A jumper is required to connect Pin 2 to Pin 3. When the +12 is supplied by the module disconnect switch to Pin 1 of the IFM1 and Pin 4 is grounded by the Ground Control Switch then the inverter is activated.

**Figure 5—Ground Control Method.
New Installation with OEM designed ground control switch relay.**



Section 4: Installing the Remote Power Inverter Indicator Panel and Remote Charge Indicator Panel



NOTE

The Remote Charge indicator Panel may only be used with inverter systems equipped with the battery charger option, such as the 20-1050CU1 Inverter.

Both the Inverter and Charger Remote Panels contain a red and green LED indicator. On the inverter panel, the green indicator light signifies the unit is ON or in Standby mode. On the charger panel, the green light indicates the presence of shore/utility power and that the battery is being maintained at its current level. For both the inverter and charger, the red, Fault LED indicator shows problems such as over temperature, overcurrent, overload, or low battery.

The panels have a sealed overlay which mount on a flat surface. Each panel is equipped with a LED or pigtail harness for easy installation. The following installation procedure applies to both the inverter and charger panels:

- Step 1. Select a location for the panel (identify the final location for the inverter and charger panels).

Step 2: Identify wires for installation.

Identify the gray, green, and red wires on the inverter panel and ambulance electrical system. Identify the brown, white, and black wires on the charger panel and the wires to be used in the vehicle's electrical system.

Step 3: Splice and arrange wires.

Splice together like-colored wires from the ambulance electrical system to the status panel using an insulated butt splice or equivalent. Carefully arrange the wires such that the panel mounts flush against the surface to which it is mounted.

Step 4: Secure panels to surface.

Mount the panels using #8 screws through the four holes in the panel. If the panel is mounted on the outside of the vehicle, it should be sealed with a bead of RTV.

Table 1 indicates the remote interface pin assignments for connecting the Inverter and Charger Remote Status Display Panels to the IFM1.

Table 1

Remote Panel	IFM1 Interface Module
Inverter Panel:	
Gray (Common)	Pin—6
Green (Inverter LED)	Pin—7
Red (Fault LED)	Pin—8
Charger Panel:	
Brown (Common)	Pin—9
White (Charger LED)	Pin—10
Black (Fault LED)	Pin—11

Section 5: Connecting the Remote Devices to the IFM1 Interface Module



This section describes the functions of each pin on the IFM1 Interface Module, and how to wire the remote devices.

NOTE

The +12V lead from Battery Disconnect Switch must be fused with an in-line fuse or circuit breaker of 2 Amps or less.

Pin #	Identification	Description
Pin 1	Inverter Lockout	<p>When +12 volts is present at pin 1, power is Interlock applied to the Remote On/Off switch, allowing it to activate the system's Inverter mode.</p> <p>Pin 1 must be wired through a 2 Amp fuse to the Battery Disconnect Switch, Ignition Switch, Module Disconnect Switch, or other control circuit.</p>
Pins 2-5	Remote On/Off	<p>These pins provide maximum flexibility for Switch Circuit incorporating the remote On/Off Switch into the ambulance control circuits.</p> <p>These pins can be configured such that the ambulance control circuits provide a ground to activate the inverter, and allow the use of relays for use with a lighted rocker switch or relays.</p> <p>Two jumpers are required for these pins if no remote switch is used: Pin 2 to Pin 3; Pin 4 to Pin 5. See configuration drawings for more information.</p>
Pin 2	Remote Control	Pin 2 sends a +12 volt signal to a remote switch or relay. When +12 volts is present at Pin 1. To turn on the inverter, the closed contact of the switch or relay should connect power from Pin 2 to Pin 3.
Pin 3	Remote Control	Pin 3 is connected to Pin 2 with a jumper, or by closing the contacts of a switch or relay.
Pin 4	Remote Control	Pin 4 allows a ground control signal to activate the Inverter mode. This configuration requires an external contact close to the chassis ground, and a jumper between Pin 2 and Pin 3, (Pin 5 is not used). If this ground control mode is not used, pin 4 must be connected to a remote switch circuit.
Pin 5	Remote Control	Pin 5 is a ground pin used with Pin 4. This ground circuit should be used with the Remote Control Switch only, and should never be connected to vehicle ground, as excessive ground current through this pin could damage the interface module or inverter remote circuit.

Pin #	Identification	Description
Pins 6-8	Inverter Indicator Panel	<p>The IFM1 Interface Module operates a pair of high-brightness LED displays on the optional Power Inverter Indicator Panel</p> <p>Pin 6 provides current-limited +5 V power to the anodes of the two LEDs in the remote panel. Pin 6 is wired to the gray wire.</p> <p>Pin 7 is a 100 Watt resistor switched to ground, lighting the <i>Inverter</i> LED. Pin 7 is wired to the green wire.</p> <p>Pin 8 is another 100 Watt resistor switched ground, lighting the <i>Fault</i> LED. Pin 8 is wired to the red wire.</p>
Pins 9-11	Charger	<p>The IFM1 operates a pair of high-brightness Indicator Panel LED displays on the optional Remote Charge Indicator Panel.</p> <p>Pin 9 provides current-limited +5 V power to the anodes of the two LEDs in Remote Status Display panel. Pin 9 is wired to the brown wire.</p> <p>Pin 10 is a 100 Watt resistor switched to ground to light the <i>Charger</i> LED. Pin 10 is wired to the white wire.</p> <p>Pin 11 is another 100 Watt resistor switched to ground to light the fault LED. Pin 11 is wired to the black wire.</p>
J1 Connector		<p>Use the 2 ft. telephone-style cable to connect this to the remote circuit of the 20-1000TUL Inverter or the 20-1050CUL Inverter/Charger.</p>

Section 6: Operating the IFM1 Inverter Remote System



NOTE

The battery charger/conditioner will always operate if AC Input Power (shore/utility power) is present.

Remote System On/Off Switch

The Remote System On/Off Switch (Vanner p/n D06781) allows the control of the inverter system from a remote location. The rocker switch is equipped with a indicating light that illuminates to show that the inverter is in operation. **Note that this switch controls only the DC to AC inverter portion of the 20-1050CUL system. The battery charger/conditioner will always operate if AC Input Power (shore/utility power) is present.**

Inverter Lockout Interlock

The Inverter Lockout Interlock is provided to ensure that the vehicle's battery does not accidentally discharge when connected to shore power. The ambulance's Module Disconnect Switch (or alternatively the ignition switch) is wired to the IFM1 Interface Module in such a way to disable the inverter when the switch is turned off. In the disabled condition, the inverter will not operate if the shore power was disconnected for any reason. Without this lockout the loss of shore power would cause the transfer switch to connect the AC loads to the Inverter when the vehicle was off.

Remote Inverter and Charger Panels

Each remote panel contains two indicating LEDs. The system status indicated by these LEDs directly relate to the LEDs on the front panel of the inverter system. The following table describes the function of each LED.

IFM1 Power Inverter Status Panel

Inverter	Light Action	Description
<i>This LED indicator operates at the same time as the Inverter LED on the front panel of the unit.</i>		
	Steady Green Light	Inverter is On and operating.
	Single Blinking Green Light	Inverter circuit is Off. Shore power is On and supplying AC power to the AC loads. The inverter will turn On and supply the load if shore power is lost.
	Double Blinking Green Light	Inverter circuit is Off. Shore power is Off. The inverter is waiting for a load greater than 5 watts to be turned on.
Fault	Light Action	Description
	Red Light	Unit Shutdown—Check the inverter's front panel LEDs for reason of shutdown; Low Battery, Overload, or Overtemp.

IFM1 Charger Indicator Status Panel

Charger	Light Action	Description
<i>The green ready and the yellow high charge LEDs on the front panel of the inverter/charger combine to run the Charger LED in the status panel.</i>		
	Steady Green Light	The charger is On and operating. The batteries are near full charge and the charger is in the maintenance mode. The charger is in the process of holding the batteries at the float voltage. The charging current is limited based on the position of the Charger High/Low switch. Shore power is On and supplying AC power to the AC loads.
	Blinking Green Light	The charger is On and operating. The batteries were low and in need of a charge. The charger is in the process of charging the batteries to the bulk voltage. The charging current is limited based on the position of the Charger High/Low switch. Shore power is On and supplying AC power to the AC loads.
Fault	Light Action	Description
	Red Light	Unit Shutdown—Check the inverter's front panel LEDs for reason of shutdown; Low Battery, Overload, or Overtemp.

Section 7: Troubleshooting

SYMPTOM Inverter won't turn on.

SOLUTION Check for +12 volts at lockout terminal of the IFM1 Interface Module.
Check remote switch wiring.

SYMPTOM Status panel LED never lights, but LED on front of inverter does light.

SOLUTION Check for a bad splice or broken wire to status panel.
Check for proper communication cable connections.
Possible defective IFM1 Interface Module.
Refer to the pin definition chart for further explanation.

Limited Warranty

1. Vanner Weldon, Inc., referred to herein as Vanner, warrants that this product is free from defects in materials and workmanship for a period of one (1) year from its date of shipment from Vanner's factory.
2. This warranty does not cover defects caused by misuse, neglect, accident, reversed polarity, unauthorized repairs, and/or replacements.
3. All warranties of merchantability and fitness for a particular purpose; written or oral, express or implied, shall extend only for a period of one (1) year. There are no other warranties which extend beyond those described on the face of this warranty.
4. Vanner does not undertake responsibility to any purchaser of its product for any undertaking, representation, or warranty made by any dealers or distributors selling its products beyond herein expressed.
5. Vanner does not assume responsibility for incidental or consequential damages, including, but not limited to responsibility for loss of use of this product, loss of time, inconvenience, expense for telephone calls, shipping expense, loss or damage to property, or loss of revenue.
6. Vanner reserves the right to repair, replace, or allow credit for any material returned under this warranty. Any damage caused by the customer will be charged or deducted from the allowance.
7. All warranty work will be performed at Vanner's factory, or authorized repair facility. Products shall be delivered to Vanner's facility, freight prepaid. Products repaired under warranty, or replacement parts or products will be returned, F.O.B. Vanner factory.