MATE3
System Display and Controller
Owner's Manual

About OutBack Power Technologies

OutBack Power Technologies is a leader in advanced energy conversion technology. Our products include true sine wave inverter/chargers, maximum power point tracking charge controllers, and system communication components, as well as circuit breakers, accessories, and assembled systems.

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Disclaimer

Warranty Summary

Notice of Copyright

Trademarks

Date and Revision

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900-0117-01-00 Rev A

Important Safety Instructions

READ AND SAVE THESE INSTRUCTIONS!

This manual contains important safety instructions for the MATE3 System Display and Control. Read all instructions and cautionary markings on the MATE3 and on any accessories or additional equipment included in the installation. Failure to adhere to these instructions could result in severe shock or possible electrocution. Exercise extreme caution at all times to prevent accidents.

Symbols Used

⚡	**WARNING: Hazard to Human Life** This type of notation indicates that the hazard could be harmful to human life.
⚠	**CAUTION: Hazard to Equipment** This type of notation indicates that the hazard may cause damage to the equipment.
📖	**IMPORTANT:** This type of notation indicates that the information provided is important to the installation, operation, and/or maintenance of the equipment. Failure to follow the recommendations in such a notation could result in voiding the equipment warranty.

Audience

This manual is intended for use by anyone required to install and operate this equipment. Be sure to review this manual carefully to identify any potential safety risks before proceeding. Familiarize yourself with all the features and functions of this equipment before proceeding. Failure to install or use this equipment as instructed in this manual can result in damage to the equipment that may not be covered under the limited warranty.

Definitions

The following is a list of initials, terms, and definitions used in conjunction with this product.

Table 1   Terms and Definitions

Term	Definition
AC	Alternating Current; refers to voltage produced by the inverter, utility grid, or generator
AGS	Advanced Generator Start
AUX	Auxiliary 12-volt output or switched relay for inverter, charge controller, or battery monitor.
Battery Monitor	*See FNDC.*

Table 1   Terms and Definitions

Term	Definition
DC	Direct Current; refers to voltage produced by the batteries or renewable source
ETL	Electrical Testing Laboratories; short for the company ETL Semko; refers to a certification issued by ETL to OutBack products indicating that they meet certain UL standards
FCC	Federal Communications Commission
FNDC	FLEXnet DC Monitor; battery monitor manufactured by OutBack Power
Grid-interactive, grid-intertie, grid-tie	Utility grid power is available for use and the inverter is a model capable of returning (selling) electricity back to the utility grid
HBX	High Battery Transfer; a function of the remote MATE3
IEEE	Institute of Electrical and Electronics Engineers; refers to a series of standards and practices for the testing of electrical products
LBCI	Low Battery Cut-In; the recovery point from Low Battery Cut-Out
LBCO	Low Battery Cut-Out; set point at which the inverter shuts down due to low batteries
LED	Light-Emitting Diode; refers to indicators used by the inverter and the MATE3
NEC	National Electric Code
Off-grid	Utility grid power *is not* available for use
On-grid	Utility grid power is available for use (does not imply grid-interactive capability)
PV	Photovoltaic
RE	Renewable Energy
RTS	Remote Temperature Sensor; accessory that measures battery temperature for charging
SOC	State of charge of a battery bank, usually as measured by a battery monitor.
System display	Remote interface device (such as the MATE3), used for monitoring, programming and communicating with the inverter; also called "remote system display"
UL	Underwriters Laboratories; refers to a set of safety standards governing electrical products
Utility grid	The electrical service and infrastructure supported by the electrical or utility company; also called "mains", "utility service", or "grid"

General Safety

	WARNING: Limitations on Use This equipment is NOT intended for use with life support equipment or other medical equipment or devices.

	CAUTION: Equipment Damage Only use components or accessories recommended or sold by OutBack Power Technologies or its authorized agents.

	IMPORTANT: Do not attempt to install this equipment if it appears to be damaged in any way. See the Troubleshooting Section for instructions on how to return the equipment if you know, or suspect, it is damaged.

Personal Safety

	WARNING: Personal Injury ➢ Use standard safety practices when working with electrical equipment (e.g., remove all jewelry, use insulated tools, wear cotton clothing, etc.) ➢ Review the system configuration to identify all possible sources of energy. Ensure ALL sources of power are disconnected before performing any installation or maintenance on this equipment. Confirm that the terminals are de-energized using a validated voltmeter (rated for a minimum 1000 Vac and 1000 Vdc) to verify the de-energized condition.
	WARNING: Fire Hazard Do not operate the unit with damaged or substandard cabling.
	CAUTION: Equipment Damage ➢ Strictly enforce clearance requirements and keep all vents clear of obstructions that can inhibit air flow around or through the unit. ➢ Sensitive electronics inside the equipment can be destroyed by static electricity. Be sure to discharge any static electricity built up before touching the equipment and wear appropriate protective gear. ➢ Do not perform any servicing other than that specified in the installation instructions unless qualified to do so and have been instructed to do so by OutBack Power Technologies Technical Support personnel.

FCC Information to the User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

➢ Reorient or relocate the receiving antenna.
➢ Increase the separation between the equipment and the receiver.
➢ Consult the dealer or an experienced radio/TV technician for help.

Regulatory References

These documents are recommended references when installing this equipment and do not imply any certifications for this product. For specific product certifications, see the Specifications Section in this manual.

➢ National Electric Code (NEC) Article 690, (current edition)
➢ Canadian Electrical Code, Part I (CSA 107.1)
➢ UL 1741-2005 Static Inverter and Charge Controllers for Use in Photovoltaic Power Systems
➢ American National Standards Institute/National Fire Protection Agency (ANSI/NFPA) 70

Recycling Information

IMPORTANT: Recycle Electronics and Batteries

Batteries are considered hazardous waste and must be recycled according to local jurisdiction. Inverters and other electronics contain metals and plastics that can (and should) be recycled. The following are some websites and phone numbers that provide information and "how" and "where" to recycle batteries and other electronic equipment.

Earth 911, USA

Web site:	www.Earth911.com
Address:	14646 N. Kierland Blvd., Suite 100
	Scottsdale, AZ 85254
Phone:	+1.480.337.3025 (direct)

Environmental Protection Agency, USA

Web site:	www.epa.gov/recyclecity/
Phone:	+1.415.947.8000
	(Monday –Friday 8:00 AM to 12:00 PM and 1:00 PM to 4:00 PM PST)
Email:	r9.recyclecity@epa.gov

Keep America Beautiful, USA

Web site:	www.kab.org/
Address:	1010 Washington Boulevard
	Stamford, CT 06901
Phone:	+1.203.659.3000 (Main number)
Fax:	+1.203.659.3001
Email:	info@kab.org

OurEarth.org, USA

There is a place on the website for contacting OurEarth.org using email. No direct email address is provided.

Web site:	http://www.ourearth.org
Address:	P.O. Box 62133
	Durham, NC 27715
Phone:	+1.410.878.6485

National Institute of Recyclers, Mexico

Web site:	http://www.inare.org.mx/
Email:	a57841279@prodigy.net.mx, margarita@inare.org.mx
Phone:	+1.55.57.85.9160
Fax:	+1.55.57.84.1279

Natural Resources Canada

Address:	580 Booth, Ottawa, ON K1A 0E8
Phone:	+1.613.995.0947
TTY:	+1.613.996.4397
	(Phone and TTY: Monday to Friday, 8:30 a.m. to 4:30 p.m. ET)
Web site:	http://www.nrcan-rncan.gc.ca/mms-smm/busi-indu/rec-rec-eng.htm

Office of Waste Management, Canada

Address:	Office of Waste Management
	Conservation and Protection
	Environment Canada
	Ottawa, Ontaro K1A 0H3
Phone:	+1.819.997.2800
Web site:	http://www.portaec.net/library/recycling/recycling_in_canada.html

EuroRecycle.net, Europe

The following website provides general information about recycling in Europe. It also provides a list of companies and organizations that provide recycling information or assistance.

Web site:	http://euro.recycle.net
E-mail:	http://euro.recycle.net/cgi-bin/feedback1.cgi?w=27
	(This is an online form providing a means to contact the owners of the website.)

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Introduction

Purpose

A renewable energy system requires some combination of inverter/chargers, batteries, charge controllers, a renewable energy power source, as well as often interfacing with a generator. All of these components need to be adjusted and monitored for optimum performance.

Functions

The MATE3 System Display and Control provides a window to the system and allows for programming of each OutBack component for maximum efficiency.

Specifically, the MATE3:

➢ Coordinates system operation, maximizes performance, and prevents multiple products from conflicting with each other.

➢ Permits adjustments to the power system, switching among different components, viewing the status of each component, and changing settings. Four different levels of access prevent users from changing settings that could potentially damage or disrupt the system.

➢ Programs when an inverter connects to an AC source based on time, battery voltage, or time-of-day grid usage.

➢ Start a two-wire generator using the Advanced Generator Start (AGS) Mode based on voltage, load, time of day, and the state of charge of the batteries.

➢ Control auxiliary AC or DC loads such as cooling fans and relays.

➢ Links to as many as ten OutBack Inverter/Chargers and OutBack charge controllers. (OutBack HUB Communications Manager is required.)

➢ Issue a global Bulk or EQ recharging command which includes the charge controller's charging function. (OutBack HUB Communications Manager is required.)

Features

The MATE3 include the following features.

➢ Six-line graphical LCD display screen for information display
➢ Four soft keys and six hot keys for navigation and programming
➢ Two navigation keys for moving through the menu maps for each device
➢ One navigation key for selecting devices connected to the HUB Ports.
➢ One LOCK key to lock access levels to prevent unauthorized changes to settings.
➢ Circular, pressure-sensitive Control Wheel with an Enter button
➢ One SD memory card slot.
➢ Communication Protocol: proprietary OutBack multi-drop network
➢ Interconnecting Cable: CAT5 (8 IATIA 518B) PC non-crossover network cable (6 ft)
➢ Maximum Tested Cable Length: 1000 feet (300 m) of cable in an office/commercial building
➢ Personal computer interface: network server (under construction at this time)

Battery Status LEDs (x3)

LCD Screen

INVERTER **Hot Key**

Inverter Status LED (Yellow)

CHARGER **Hot Key**

Charger Status LED (Green)

GEN**(erator) Hot Key**

GEN Status LED (Green)

EVENTS **Hot Key**

Event LED (Red)

SD Memory Card

AC INPUT **Hot Key**

AC Status LED (Yellow)

FAVORITE **Hot Key**

Favorite Status LED (Green)

Soft Keys (x4)

TOP **Navigation Key**

LOCK **Key**

UP **Navigation Key**

PORT **Navigation Key**

Control Wheel

ENTER Button

Side View

Back View

SD Memory Card Slot

Ethernet Port (Computer)

Port to HUB or OutBack Device

Figure 1   MATE3 Features

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Installation

Location Considerations

The following information is important to consider when installing the OutBack MATE3.

➢ The MATE3 is intended for indoor installations only. Installing the MATE3 outdoors could expose it to damaging environmental conditions. Such damage is not covered by the limited warranty.

➢ Readability of the display is affected by direct sunlight. It should be positioned about "eye-level" for easier viewing and access.

➢ The MATE3 voltage is less than 30 Vdc and is thus considered a "limited energy circuit" normally requiring no conduit (consult the local inspector for specific installation requirements). Cable runs must be protected and runs must be in approved conduit when conditions require and not exposed to the weather.

> **IMPORTANT:**
> Signal degradation can result if cable is run in conduit with AC wiring or in other electronically "noisy" environments; these can affect the maximum length the cable can run without incurring transmission errors.

Mounting Considerations

The MATE3 includes (1) *OBCAT 6 Cat5* cable with the correct RJ45 connectors already installed. Longer (up to 1000') or shorter cables can be purchased pre-made (at home improvement or computer stores).

➢ Cat5 cable is not as strong as standard house wiring and must be handled carefully. Avoid kinking the cable or tearing its outer sheathing.

➢ Use plastic standoff cable staples, J-hooks, or cable trays to support long runs of Cat5 cable. *Do not splice cables.*

Several mounting brackets are sold as accessories for the MATE3. Follow the installation instructions included with the bracket chosen when mounting the MATE3.

Materials Included

➢ MATE3

➢ SD Memory Card (1 GB)

➢ 6' CAT5 non-crossover cable

➢ Silicon grease pack

➢ *MATE3 System Display and Controller Owner's Manual (*this manual)

Dimensions
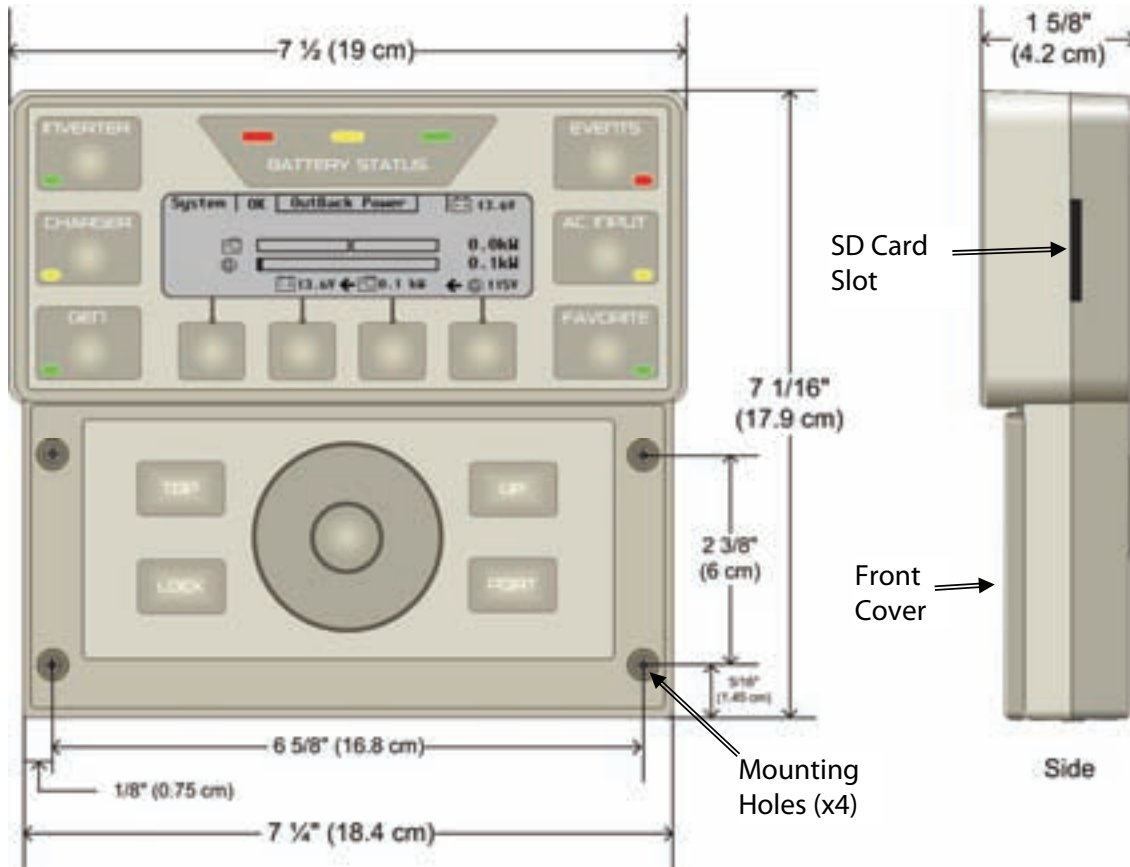
Figure 2   MATE3 Dimensions

To Install the MATE3

1. Install all other OutBack components first.

2. Locate the position for the MATE3. Allow room (approximately 2-3") on the right side of the MATE for the SD Card to be inserted or removed.

3. Run the CAT5 cable from the source (HUB, inverter, or charge controller) to the MATE3's location. Connect the CAT5 cable to the source, but not to the MATE3.

4. Power up each OutBack device connected directly or indirectly (through the HUB) to the MATE3.

5. Then connect the CAT5 cable to the port on the MATE3.

6. Secure the MATE3 to the mounting surface or mounting bracket, if present.:

    ➢ If a mounting bracket is used, install the mounting bracket using the instructions supplied with the bracket.

    ➢ If a mounting bracket is not used, use the dimensions above to mark four holes in the wall. Drill leader holes, then run the screws through the mounting holes into the wall surface.
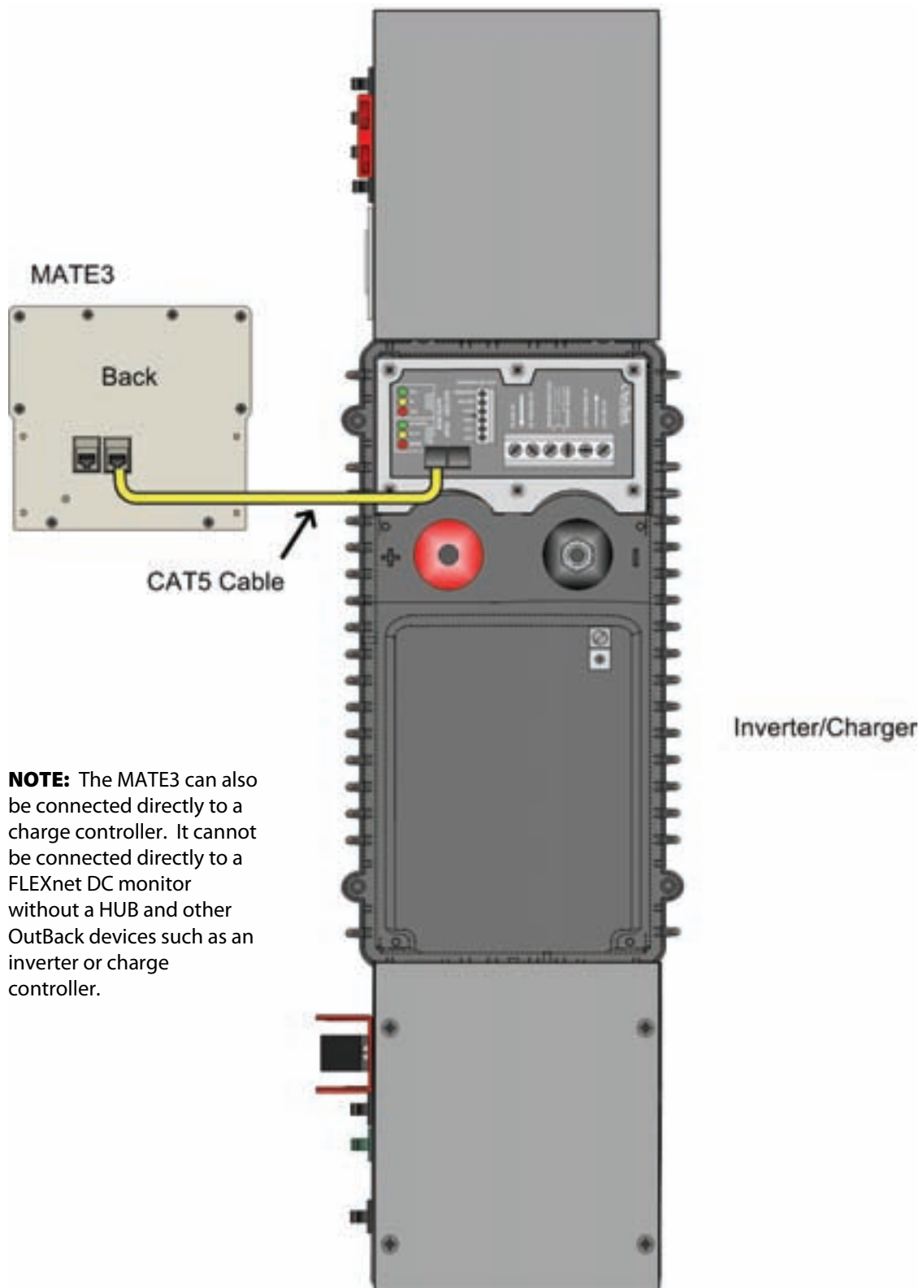
NOTE: The MATE3 can also be connected directly to a charge controller. It cannot be connected directly to a FLEXnet DC monitor without a HUB and other OutBack devices such as an inverter or charge controller.

Figure 3   MATE3 Connections (no HUB)

FLEXmax Charge Controller

HUB10 Communication Manager

MATE3

Back

Laptop

Optional

CAT5 Cable

CAT5 Cable

CAT5 Cable

CAT5 Cable

This feature is not implemented at this time.

Inverter/Charger
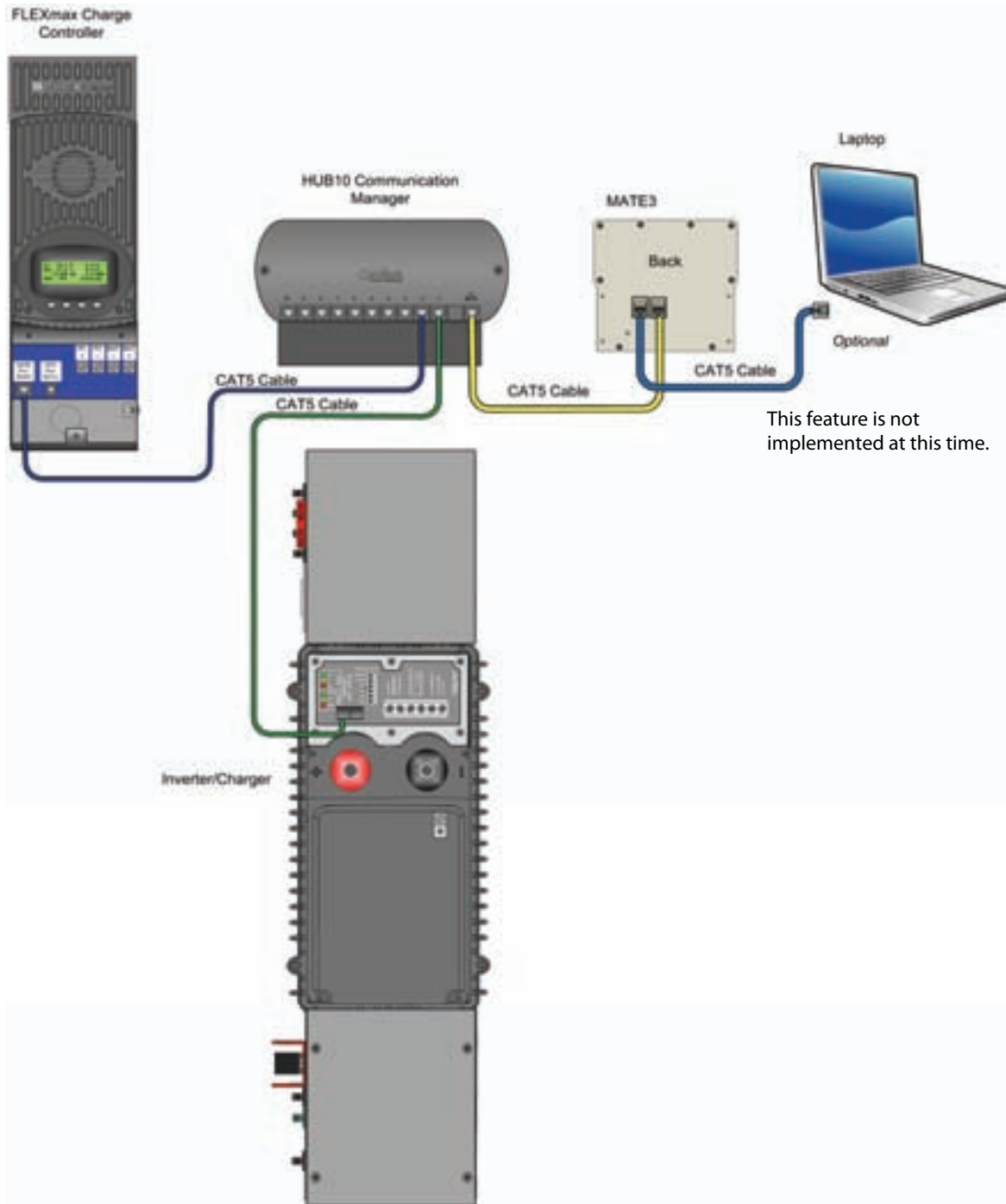
Figure 4   MATE3 Connections (with HUB)

Set Points

A set point is a condition, measurement, or baseline that a user establishes in order for something else to happen (such as when to start or stop a generator).

For example:

➢ **Example #1.** With a home thermostat, when predetermined temperatures and times are set for weekdays and weekends, the thermostat signals to a heating/cooling system to turn on at one time until a certain temperature is reached, maintain that temperature, and finally shut off at a later time, usually during sleep hours to conserve energy. Otherwise, the user would have to manually control the system.

➢ **Example #2.** A timed light will turn on and off based on a specified time or level of ambient light, or possibly by detecting motion.

The MATE3 allows a user to view, monitor, and establish all the settings and values that occur while the system is running. From time to time, these settings and values might be adjusted as components are added or upgraded, electrical loads increase, or patterns of usage change.

Types of Settings

The OutBack MATE3 accommodates a wide range of time-based and voltage-level functions and conditions for maximum control of the power system.

The following types of settings may require adjustments depending on the specific installation:

➢ Start and stop times for different sources of energy (when to use grid-supplied power, stored battery power, or generator-supplied power),

➢ Frequency and duration of battery recharging (based on the requirements of the battery manufacturer), and

➢ Inverter response to battery voltage (low battery cut-out, low battery cut-in)

For additional information and discussion on the OutBack MATE3, go to:

www.outbackpower.com and join our forum discussions.

Communication Protocol

This feature is not implemented at this time.

Software Required

TBD

Hardware Required

TBD

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Operation

The MATE3 provides the means for programming OutBack inverter/chargers, charge controllers, and battery monitors when pre-programmed default settings do not work for the destined installation.

📖ℹ️	**IMPORTANT:** The OutBack inverters have nonvolatile memory and will retain any settings that have been changed, even after the MATE3 is removed. If a system does not have a MATE3, an installer can bring a MATE3 to the site temporarily, install it, change the settings, and then remove it.
📖ℹ️	**IMPORTANT:** Some functions are not based in the inverter, but are part of the MATE3's software. They will not function if the MATE3 is removed. These functions are listed beginning on page 112.

Display and LED Indicators
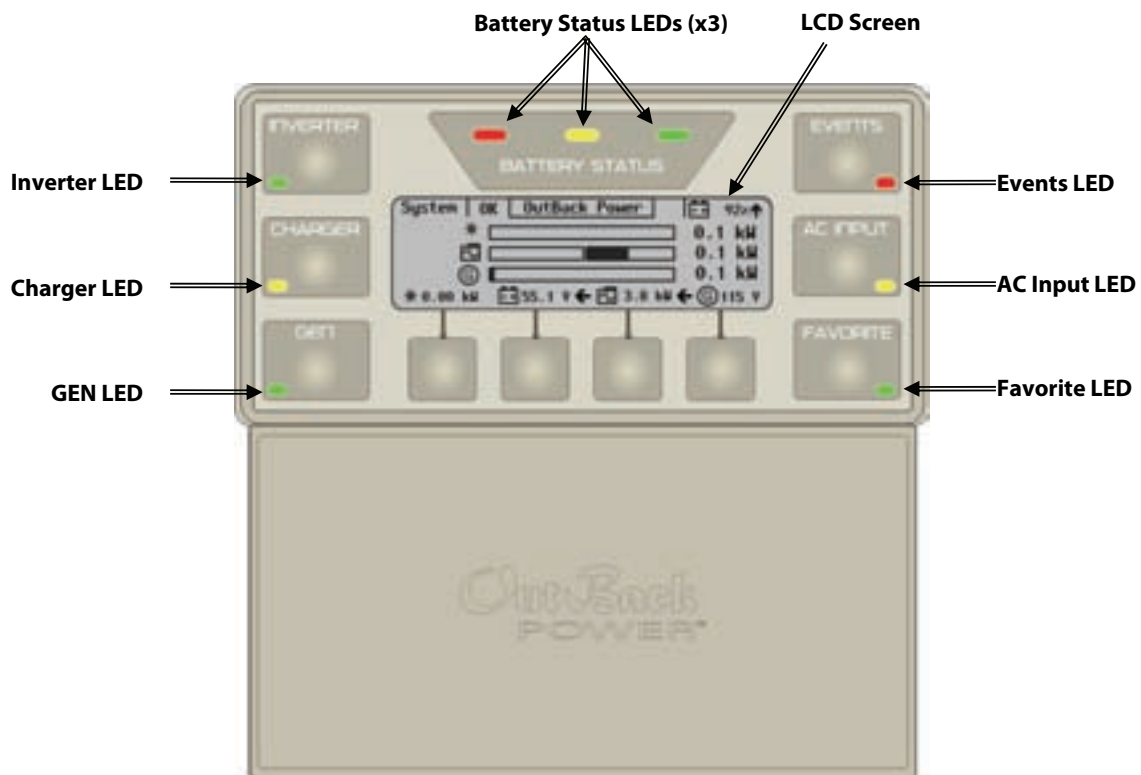
Figure 5   Display LED Indicators

LED Status Indicators

Battery LEDs

Three LEDs provide a visual reference to indicate the condition of the battery bank.

➢ A GREEN LED means the batteries have an adequate charge at that time. It does not always mean they are full. If an FNDC is installed, this means the batteries are ≥ **80%** .

➢ A YELLOW LED means the batteries are somewhat discharged. If an FNDC is installed, this means the batteries are ≥ **60%** and ≤ **70%**.

➢ A RED LED means the batteries are greatly discharged and may require attention. If an FNDC is installed, this means the batteries are **< 60%**. May be accompanied by an event indicator and a ***Low Battery V*** error. (See pages 23 and 40.)

Color	12 Vdc Unit	24 Vdc Unit, ± 0.2 Vdc	32 Vdc Unit, ± 0.3 Vdc	36 Vdc Unit, ± 0.3 Vdc	48 Vdc Unit, ± 0.4 Vdc	Battery Status
GREEN	12.5 Vdc or higher	25.0 Vdc or higher	33.3 Vdc or higher	37.5 Vdc or higher	50.0 Vdc or higher	ACCEPTABLE
YELLOW	11.5 to 12.4 Vdc	23.0 to 24.8 Vdc	30.6 to 33.0 Vdc	34.5 to 37.2 Vdc	46.0 to 49.6 Vdc	USABLE
RED	11.4 Vdc or lower	22.8 Vdc or lower	30.4 Vdc or lower	34.2 Vdc or lower	45.6 Vdc or lower	LOW

[1] Gaps in the table (higher-voltage units) are due to the resolution of the inverter's DC meter.

[2] These voltage settings are not the same as the inverter's Low Battery Cut-Out (LBCO) voltage. The Battery LED settings cannot be changed.

Inverter LED (green)

This LED is located on the INVERTER hot key. (See page 47.) It provides a visual reference for the status of the inverter operation.

➢ **ON** (solid) — inverter is converting DC to AC in order to power loads.
➢ **ON** (flashing) — the inverter is in Search mode.
➢ **OFF** (not illuminated)

~ the inverter is not converting DC power to AC power, or
~ the AC input source is powering the loads.

If any inverters in a stacked system have a different inverting status from the master, this LED will not display their status.

Charger LED (yellow)

This LED is located on the CHARGER hot key. (See page 48.) It provides a visual reference for the status of the battery charger.

➢ **ON** (illuminated) — a device on the HUB is in one of the active stages for charging batteries. The device may be an inverter or a charge controller.

➢ **ON** (flashing) — the batteries are being equalized.

➢ **OFF** (not illuminated) — no device is actively charging the batteries, for several reasons.

~ the charger(s) may be functional, but in a quiescent state such as Silent.
~ the charger(s) may be functional, but the charging sources may be disconnected or unavailable.
~ the charger(s) may be turned off.

Gen LED (green)

This LED is located on the GEN hot key. (See page 52) It provides a visual reference for the status of a generator that is under control of the Advanced Generator Start (AGS) function. (See page 114.)

➢ **ON** – The generator is detected to be running after receiving an On command in the Generator Status menu. The MATE3 determines the generator is running based on input AC voltage.   This LED will usually illuminate in conjunction with the AC INPUT LED.

➢ **OFF** (not illuminated) – The Generator Status menu has been set to Off, or the AGS function has not been enabled. If the generator shuts down or stops delivering power, this LED will remain on until a generator fault is declared.

Events LED (red)

This LED is located on the EVENTS hot key. (See page 53.) It provides a visual indication that an event message has been generated. Events are usually indications of a warning or error condition.

➢ **ON** (solid) – An error has occurred. This is usually accompanied by inverter shutdown. This event can also indicate a generator fault if the voltage is lost from an automatic generator. (See page 52.)

➢ **ON** (flashing) – A warning has occurred.

➢ **OFF** (not illuminated) – No event has occurred.

This LED will remain on until the event has been acknowledged in the *Event Status Detail* menu. (See page 53.) It may be necessary to troubleshoot and deal with the cause of the event, using the Inverter soft key. (See page 37 – 40.) Specific error or warning messages are defined in the inverter *Operator's Manual*.

AC Input LED (yellow)

This LED is located on the AC INPUT hot key. (See page 54.) It provides a visual reference for the status of the AC input.

➢ **ON** (solid): The AC source is connected and providing power. Unit may or may not be charging the batteries, depending on settings.

➢ **ON** (flashing): The AC source is present but has not been accepted. If flashing continues, the unit is refusing the source. This can occur for the following reasons.

~ The AC source may have quality issues. To determine system warnings for AC source problems see page 47 for the warnings menus. To view AC source measurements see page 54.

~ In the AC INPUT hot key menu, the *AC Input Status* is set to **Drop**. See page 54.

~ The HBX function or the Grid Use Time function intentionally disconnected the inverter. (See page 127 and page 129 for descriptions of these modes.)

➢ **OFF** (not illuminated): No AC source is detected.

If any inverters in a stacked system have a different inverting status from the master, this LED will not display their status.

Favorite LED (green)

This LED is located on the Favorite hot key. (See page 55.) It indicates the use of this hot key to select often-used menus for rapid access.

➢ **ON** (Solid): The hot key has been pressed and a Favorite can be selected.

➢ **ON** (Flashing): The hot key has been held down to program a Favorite.

➢ **OFF** (not illuminated):   No particular status. The Favorite LED only illuminates in response to the hot key being pressed.

Power Up Screens

The MATE3 powers up as soon as it is plugged into a powered OutBack product. It will immediately cycle through the startup screens. It will proceed to locate and identify the attached components and the ports they occupy on the HUB. It will then stop on the Home screen.

Power Up Screen

Device Identification Screen

Port Assignment Screen
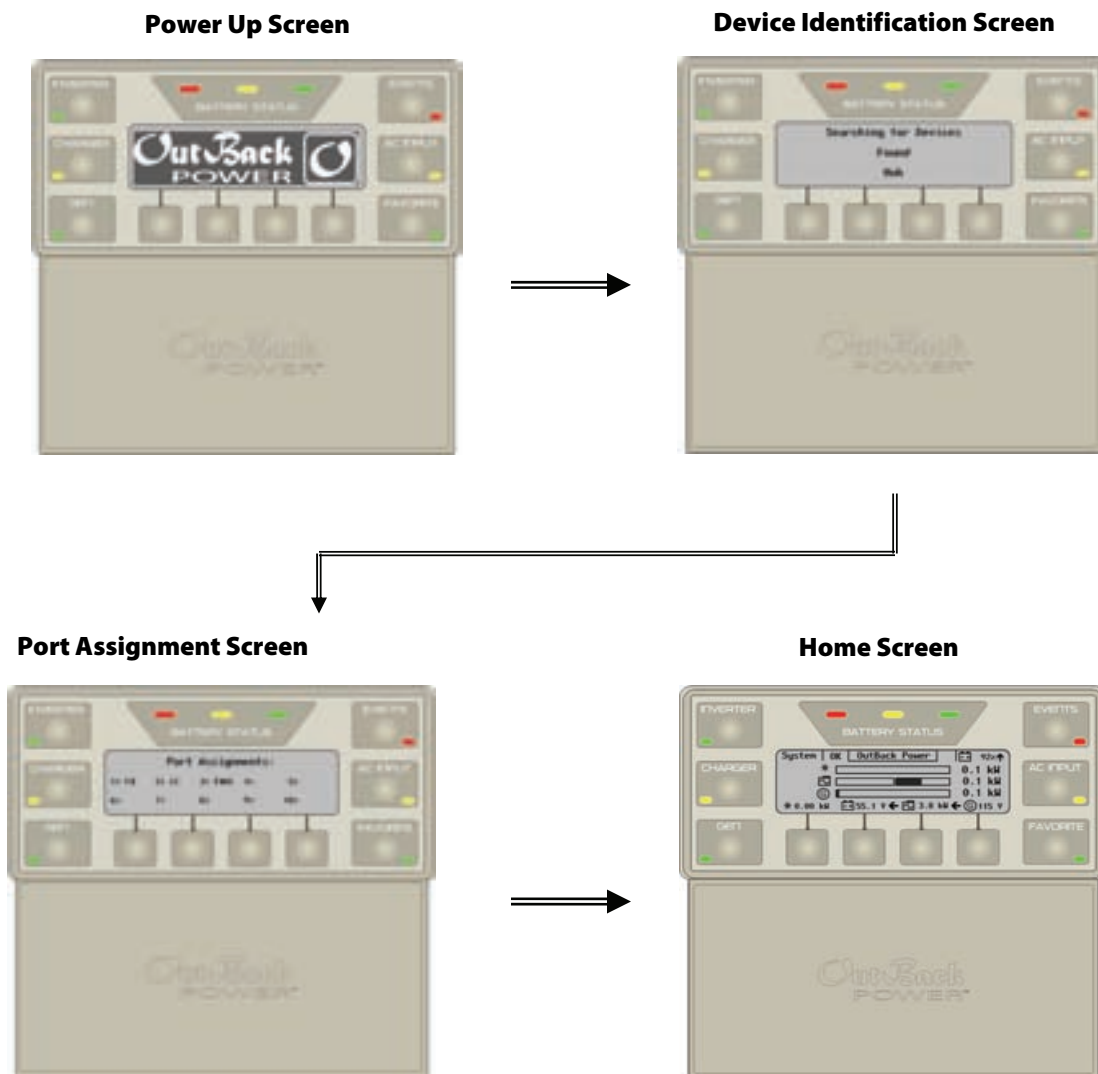
Home Screen

Figure 6   Power Up Screens

Home Screen

The Home screen appears after the MATE3 detects the HUB (and any devices connected to it) or detects a single device if a HUB is not in use.
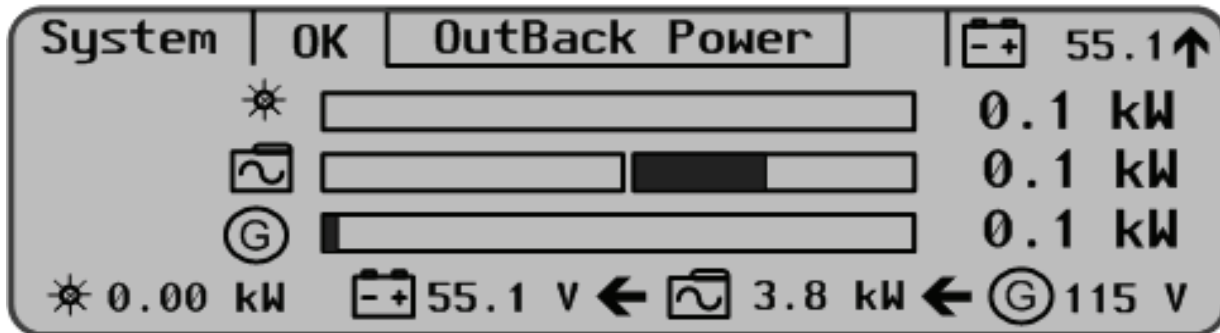
Figure 7   Home Screen Symbols (example)

Home Screen Types

The Home Screen will vary depending on the "Type" of system installed. The System Type is set in the System Information screen (see page 64). Four types are available:

- ➢ **Off Grid** is for when no utility grid is available. (Default)
- ➢ **Grid Tied** is for grid-interactive inverters that are capable of returning power back to the grid. Most commonly used with renewable energy systems.
- ➢ **Backup** is for using the inverter system to back up the utility grid.
  (This feature is not implemented at this time. Do not select.)
- ➢ **AC Coupled** is a specific application where Outback inverters serve as a simulated grid for a batteryless grid-tied inverter. This system forms its own 'micro-grid'.
  (This feature is not implemented at this time. Do not select.)

Meter Bars

Much of the Home screen data is shown by kilowatt meters in the form of black bars. These meter bars expand to right or left with an increase in wattage. The meter bars next to the various icons are based on **System Information** listed on page 64. The scale of a bar will vary with the size set for each element.

The ☀ meter bar is scaled according to the **Array Wattage** setting.

The left-hand 〜 meter bar is scaled to the **Gen kW Rating** setting. If **Gen Type** is set to DC, this bar is scale to the **Max Inverter kW** setting.

The right-hand 〜 meter bar is scaled to the **Max Charger kW** setting.

The Ⓖ meter bar is scaled to the **Gen kW Rating** setting.

The left-hand **S** meter bar is scaled to the total of the **Max Inverter** kW and **Max Charger kW** settings.

The right-hand **S** meter bar is scaled to the **Max Inverter kW** setting.

The 🏠 meter bar is scaled to the **Max Inverter kW** setting if the system is not in PassThru mode. If the system is in PassThru, then it is equal to 7.2 kW multiplied by the number of inverters present on the HUB. See subsequent pages for the appropriate Home screens, icons, and meter bars.

Off Grid Home Screen
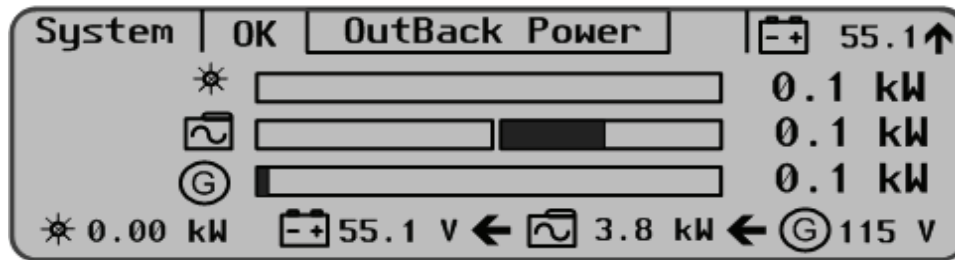
LEGEND					
Icon(s)	**Description**		**Icon(s)**	**Description**	
Battery	Battery		Inverter	Inverter	
PV	PV		Generator	Generator	
PV current charging batteries	PV current charging batteries		Gen current used by inverter and loads	Gen current used by inverter and loads	
or	Battery current used by inverter (➜) or charged by inverter (⬅)		⬇ or ⬆	Net current flowing out of (⬇) or into (⬆) batteries (measured by Battery Monitor)	

Figure 8   Home Screen for Off Grid

NOTES:

G	The generator symbol in the lower right corner of the screen marks a voltmeter that measures the AC voltage of the generator (or AC source). The generator symbol next to the meter bar shows a graphic display of the power being used from the generator (or AC source). This meter expands from left to right.
(inverter)	The inverter symbol on the bottom of the screen marks a kilowatt meter that measures the amount of power being used by the inverter from the generator (or AC source). The inverter symbol next to the center of the screen actually marks two meter bars. ➢ The meter on the left measures the amount of power taken out of the inverter when inverting or supporting loads. This meter bar expands from right to left. ➢ The meter on the right measures the amount of power taken into the inverter when charging. This meter bar expands from left to right.
(battery)	The battery symbol on the bottom of the screen marks a voltmeter that measures the battery voltage. This voltage is not compensated for temperature. For a compensated voltage, see page 38. ➢ The battery symbol in the top right corner of the screen marks a percentage meter that shows the SOC of the batteries as measured by the battery monitor. ➢ If no battery monitor is present, this figure will be replaced by another battery voltage meter.
(PV)	The PV symbol in the lower left of the screen marks a kilowatt meter that measures the amount of PV power generated. The PV symbol next to the bar shows a graphic display of the PV power generated. This meter bar expands from left to right. If no charge controller is present on the HUB, neither of these symbols will be present.
OK	This symbol indicates that no problems are noted with either the inverter, the generator, or the batteries. ➢ If an inverter fault occurs, it will be replaced with the symbols ! (inverter). (An event message will also appear.) ➢ If a generator fault occurs, it will be replaced with the symbols ! **G**. (An event message will also appear.) ➢ If a battery monitor is present and registers a battery problem, it will be replaced by the symbols ! (battery) or **X** (battery). (An event message will also appear.) See pages 132 and 139 for information on these messages.

Grid Tied Home Screen
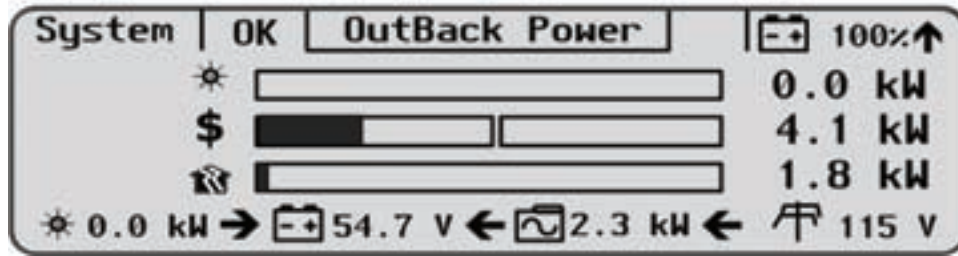
LEGEND			
Icon(s)	**Icon(s)**	**Icon(s)**	**Icon(s)**
[battery icon]	Battery	[inverter icon]	Inverter
[PV icon]	PV	[utility grid icon]	Utility Grid
[PV → battery icon]	PV current charging batteries	[inverter ← grid icon] or →	Grid current used by inverter and loads (←), or inverter current sold back to grid (→)
[battery → inverter icon] or ←	Battery current used by inverter (→) or charged by inverter (←)	↓ or ↑	Net current flowing out of (↓) or into (↑) batteries (measured by Battery Monitor)
$	Grid-Tie/Sell	[loads icon]	Loads (AC)

Figure 9   Home Screen for Grid Tied

NOTES:

[utility grid icon]	The utility grid symbol in the lower right corner of the screen marks a voltmeter that measures the AC voltage of the utility grid (or AC source).
[inverter icon]	The inverter symbol on the bottom of the screen marks a kilowatt meter that measures the amount of power being used by the inverter from the generator (or AC source). This meter bar expands from left to right.
[battery icon]	The battery symbol on the bottom of the screen marks a voltmeter that measures the uncompensated battery voltage. The battery symbol in the top right corner of the screen marks a percentage meter that shows the SOC of the batteries as measured by the battery monitor. If no battery monitor is present, this figure will be replaced by another voltmeter.
$	The dollar symbol next to the bar actually marks two meter bars. ➤ The meter on the right measures the amount of power sold back to the utility grid when grid-tied. This meter bar expands from left to right. ➤ The meter on the left measures the amount of power bought from the grid or AC source for charging or loads. This meter bar expands from left to right.
[loads icon]	The house symbol next to the meter bar measures power delivered to the inverter's output. This meter bar expands from left to right.
[PV icon]	The PV symbol in the lower left of the screen marks a kilowatt meter that measures the amount of PV power generated. The PV symbol next to the bar shows a graphic display of the PV power generated. This meter expands from left to right. If no charge controller is present on the HUB, neither of these symbols will be present.
OK	This symbol indicates that no problems are noted with either the inverter, the utility grid, or the batteries. ➤ If an inverter fault occurs, it will be replaced with the symbols ! [inverter icon] (An event message will also appear.) ➤ If a grid problem occurs, it will be replaced with the symbols ! [grid icon]. (An event message will also appear.) ➤ If a battery monitor is present and registers a battery problem, it will be replaced by the symbols ! [battery icon] or X [battery icon]. (An event message will also appear.) See pages 132 and 139 for information on these messages.

Basic Navigation

Soft Keys

Four soft keys are available to select the options displayed directly above each key. From the Home screen, up to four soft key options may be available.

➢ The left-center key, or **Battery** soft key, displays information on the battery bank and is marked with the symbol ⎡–+⎤. The information available with the **Battery** soft key varies depending on whether the FLEXnet DC battery monitor is present on the HUB.

➢ The right-center key, or **Inverter** soft key, displays information on any inverters present on the HUB. If no inverters are present (the ⎡∿⎤ symbol is not present), this key is inoperative.

NOTE: The **Inverter** soft key, which is only available from the Home screen, should not be mistaken for the **INVERTER** hot key, which is a MATE3 feature that is always available (see page 47). The two keys display nominally similar information, but the **Inverter** soft key has more information. Additionally, the **INVERTER** hot key can control the inverting function, and the **Inverter** soft key cannot.

➢ The far left key, or **Charge Controller** soft key, displays information on any FLEXmax charge controllers present on the HUB. If no charge controllers are present (the ☼ symbol is not present), this key is inoperative.

➢ The far right key, or **Grid** soft key, displays information on the utility grid, but only if the selected system type (see pages 25 and 64) uses the grid as a priority source (see page 77). This key only functions if the grid symbol ⊤ is present. If the generator symbol Ⓖ is present, or if no symbol is present, the **Grid** soft key is inoperative (see Figure 11).
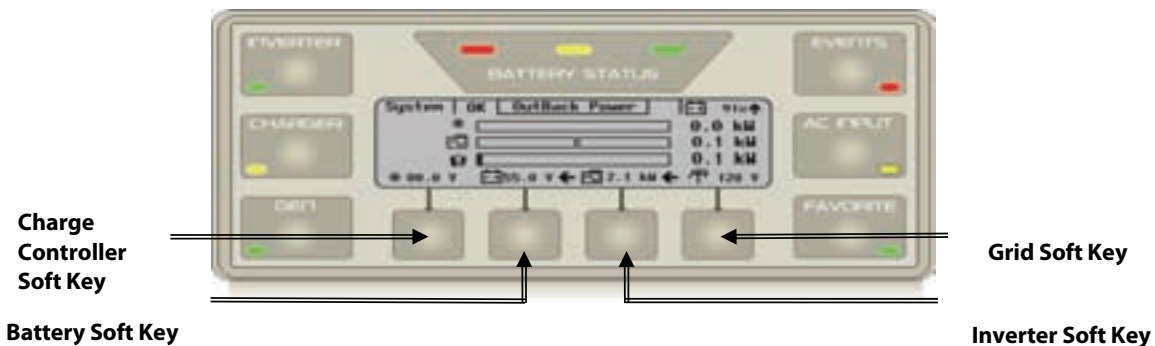
Figure 10   Soft Keys from the Grid-Tied Home Screen

Generator
Source
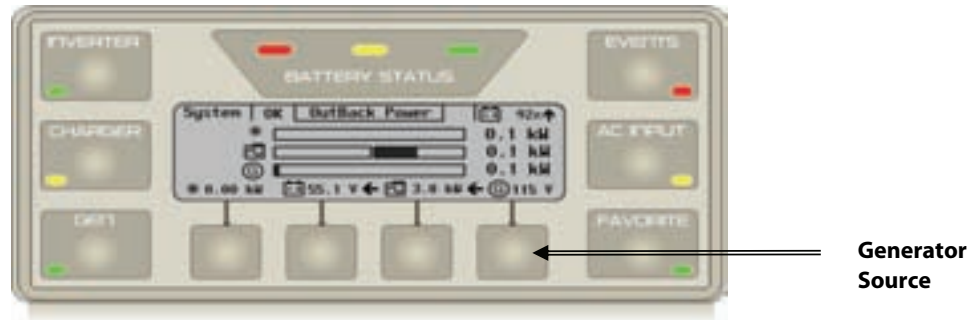
Figure 11   Soft Keys from the Off Grid Home Screen

Battery Soft Key

Home Screen

Battery Soft Key

Press this soft key to
view Battery status
information.
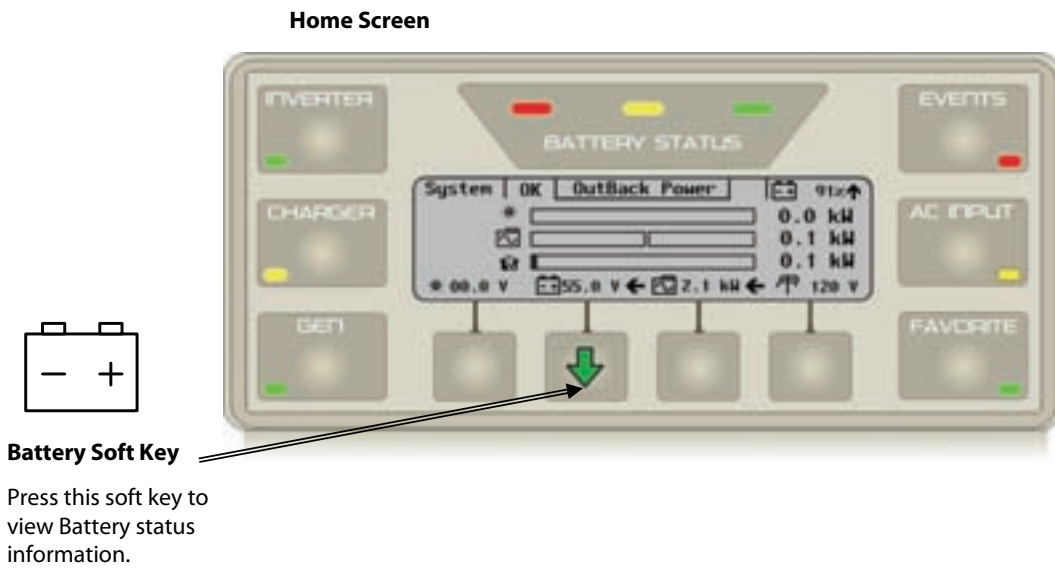
Figure 12   Battery Soft Key

If no FLEXnet DC battery monitor is present on the system, the battery soft key brings up the following
screens.

Screen Items:

Bat displays the uncompensated battery voltage.

Min displays the lowest recorded battery voltage for that day, and the time it was recorded.

Max displays the highest recorded battery voltage for that day, and the time it was recorded.

This axis shows date and time in 6-hour increments.

Soft Keys:

<**Graph>** brings up a single graph showing changes in battery voltage over time. This is the same graph shown on pages 34, 41, and 44.
<**Back**> returns to the previous screen.
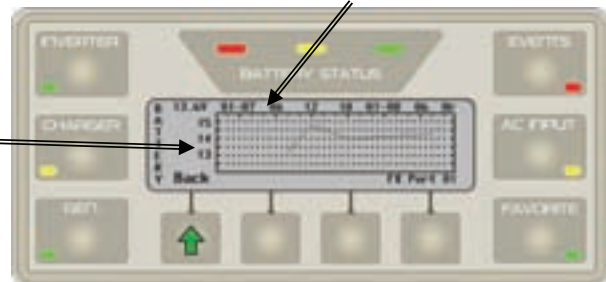
This axis shows battery voltage.

Figure 13   Battery Soft Key Screens (without a FLEXnet DC Monitor)

If a FLEXnet DC battery monitor is present on the system, the **Battery** soft key brings up the following screens.
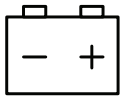
Home Screen

Battery Soft Key

Press this soft key to view Battery Status information.
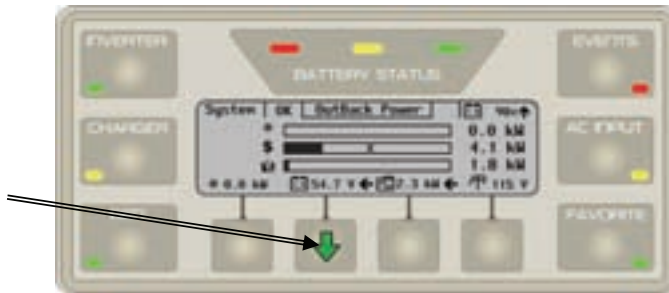
Screen Items:

The upper left corner of the screen shows the uncompensated battery voltage.

The upper right corner shows the measured State-of-Charge (SOC).

In displays the measured total current and kilowatts coming into the system from all DC sources. To the right, this line displays the total amp-hours and kilowatt-hours delivered from all sources that day.

Out displays the measured total current and kilowatts being taken out of the batteries for inverting, DC loads or any other uses. To the right, this line displays the total amp-hours and kilowatt-hours removed from the batteries that day.

Bat displays the net total current and kilowatts being sent to or taken from the batteries. To the right, this line displays the net total amp-hours and kilowatt-hours accumulated or taken from the batteries that day.

The last line shows both the highest and lowest recorded battery SOC for that day, and the time each was recorded.

The lower right corner shows the current status of the battery monitor's Auxiliary relay (also known as AUX mode or Relay mode). (See page 108.)

Soft Keys:

<**Next**> brings up a series of screens that show more detailed information on the battery and on individual shunts used with the battery monitor. These screens are shown beginning on page 31.

<**Graph**> brings up a series of screens that plot various battery information over time. The graphs include voltage, SOC, and shunt information. These screens are shown beginning on page 34.

<**Back**> returns to the previous screen.

Figure 14   Battery Soft Key Screens (with a FLEXnet DC Monitor)

From the **FLEXnet DC** screen, the <**Next**> soft key brings up the following screens.

Screen Items:

Bat displays battery voltage, net current flow (positive or negative), battery temperature, and net amp-hour accumulation for that day.

Min displays the lowest recorded battery voltage and SOC for that day, and the time each was recorded.

Max displays the highest recorded battery voltage and SOC for that day, and the time each was recorded.

Soft Keys:

<**Back**> returns to the previous screen.

<**Stats**> shows long-term battery statistics. See below.

<**Shunts**> shows the operation of up to three shunts on the battery monitor. See Figure 17.

<**Datalog**> shows the current data log. See Figure 18.

Figure 15   Next Soft Key (with FLEXnet DC)

Screen Items:

Cycle Charge Factor compares the amp-hours removed from the battery and those returned to the battery while charging. It displays the comparison as a percentage. This number can be compared against the programmed charge factor (see page 106) to judge battery charging efficiency.

Cycle kWH Charge Efficiency compares the kilowatt-hours removed from the battery and those returned to the battery during all activity (such as float charging). It displays the comparison as a percentage. This number can be used to judge overall battery efficiency.

Total Days at 100% displays the number of days since the batteries reached 100% SOC. If the batteries are not at 100%, this will read 0.

Lifetime kAH Removed accumulates the total amp-hours that were ever drained from the batteries.

Soft Keys:

<**Back**> returns to the previous screen.

<***Reset Days***> resets the Total Days at 100%

<Reset kAH > resets the Lifetime kAH removed.

Figure 16   Stats Soft Key (with FLEXnet DC)

The <**Shunts>** soft key shows the operation of up to three shunts on the battery monitor. If a shunt has not been enabled (see page 108), it will read 0.
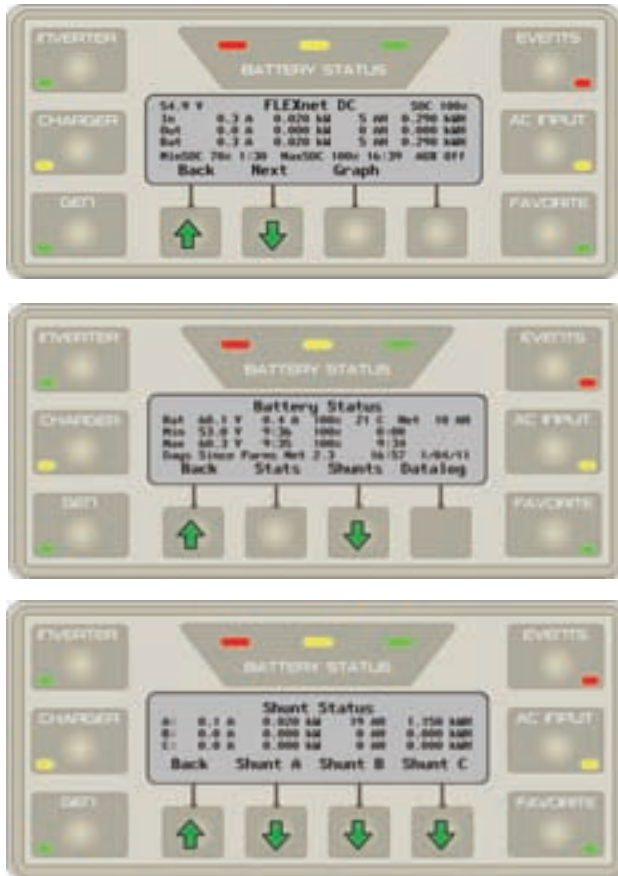
Screen Items:

A: , *B:*, and *C:* These lines display individual readings from the A, B, and C shunts. Each line shows the current and kilowatts measured on the shunt at that time, and the amp-hours and kilowatt-hours accumulated that day.

Soft Keys:

<**Shunt A>, <Shunt B>,** and **<Shunt C>** shows long-term statistics for each shunt. If a shunt has not been enabled (see page 107), its statistics will read 0.

<**Back**> returns to the previous screen.

Soft Keys:

The <**Next>** soft key presents the next shunt in alphabetical order.

<**Back**> returns to the previous screen.

Screen Items:

Returned to Battery and ***Removed from Battery*** show the total accumulated amp-hours that have been delivered to the battery bank (as charging) or removed from the battery bank (as loads).

Max Charge Rate and ***Max Discharge Rate*** show the highest level of current that was registered either entering (charging) or leaving (discharging) the batteries. The **Reset Max** soft key can reset both numbers at once.

Figure 17   Shunts Soft Key and Shunt Data (with FLEXnet DC)

The <**Datalog>** soft key shows amp-hour, watt-hour, and SOC statistics. These maintain a continuous daily log, up to 128 days, which can be recalled. One day can be displayed at a time.
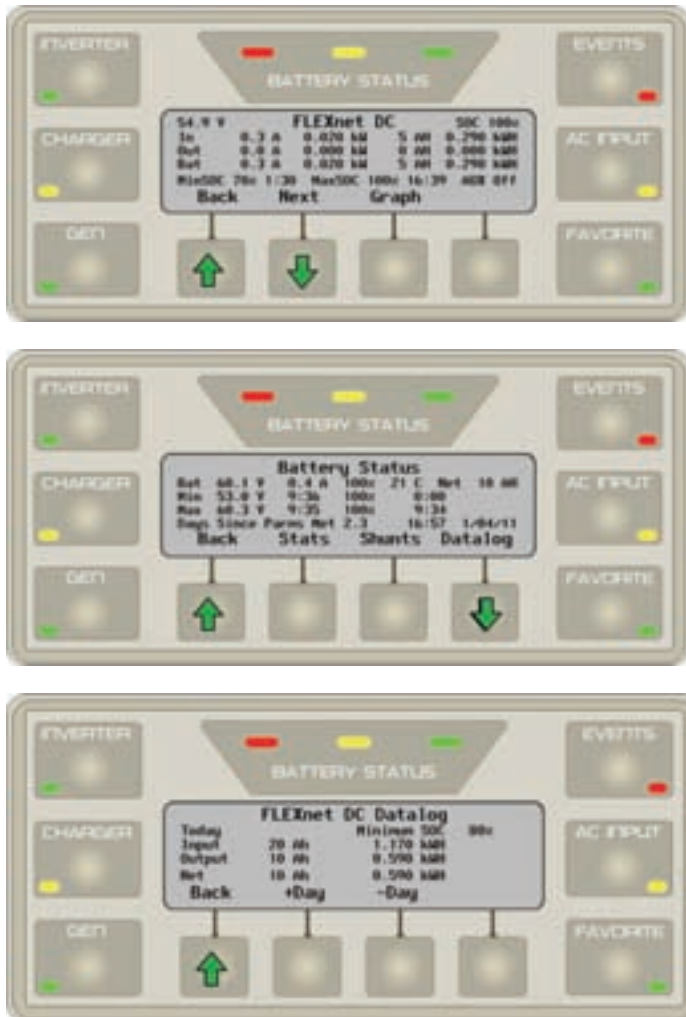
Screen Items:

Today The item in the upper left corner shows the date of the selected Datalog screen. The current Datalog screen reads "Today."

Minimum SOC shows the lowest battery state of charge (SOC) for that day.

Input shows the number of amp-hours and kilowatt-hours brought into the batteries that day.

Output shows the number of amp-hours and kilowatt-hours removed from the batteries that day.

Net shows the net gain or loss in amp-hours or kilowatt-hours that day. This is the difference between the Input and Output fields.

Soft Keys:

<**+Day>** advances the display forward by a single day. If the display reads "Today", it does nothing.

<**–Day>** advances the display backward by a single day and will display the selected date.

<**Back**> returns to the previous screen.

Figure 18   DataLog Soft Key Screen (with FLEXnet DC)

From the **FLEXnet DC** screen, the <**Graph>** soft key brings up the following screens which plot various type of data over time. The first screen shows changes in battery voltage over time. This is the same graph shown on pages 30, 42, and 45.
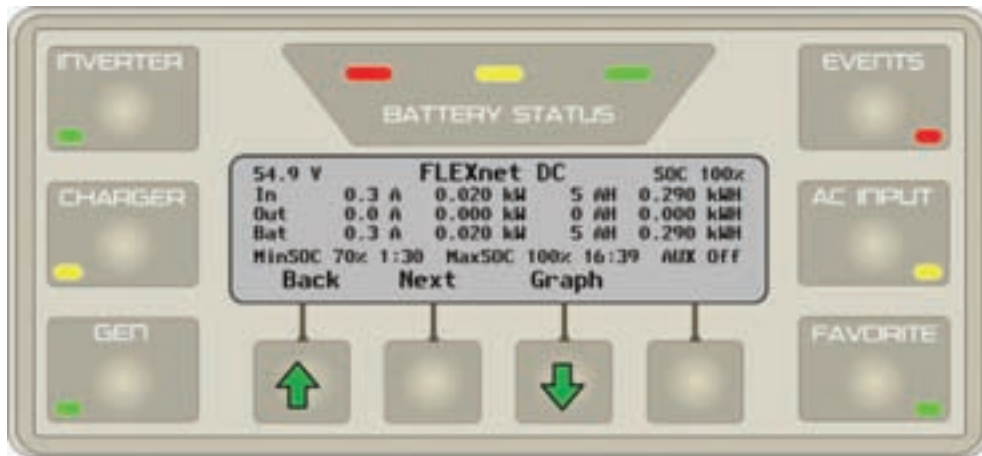

Figure 19   Graph Soft Key (with FLEXnet DC)

This axis shows date and time in 6-hour increments.

This axis shows battery voltage.
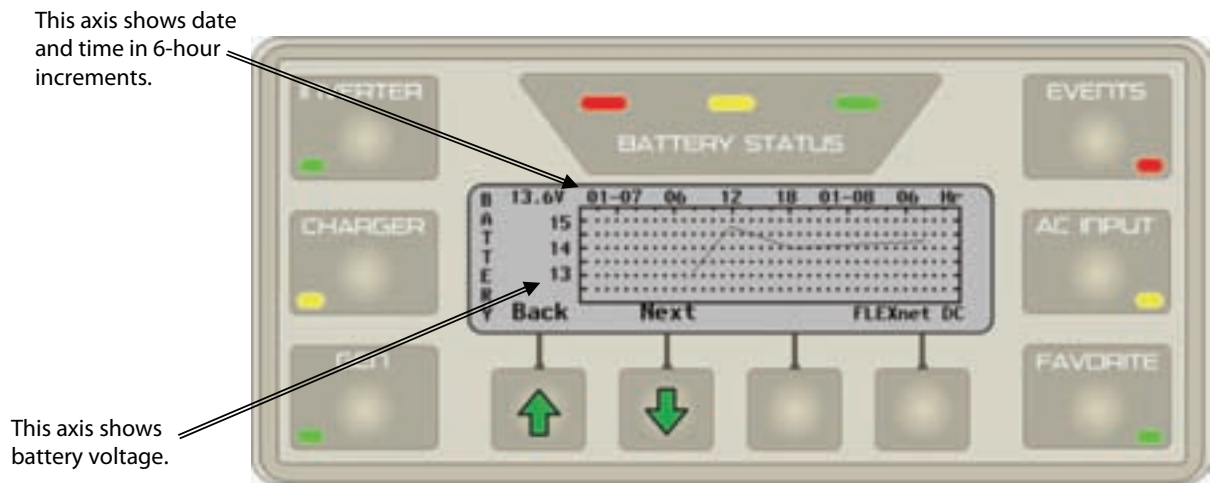
Figure 20   Battery Voltage Graph (with FLEXnet DC)

The <**Next**> soft key brings up a screen which shows changes in SOC over time.

This axis shows date and time in 6-hour increments.

This axis shows SOC.
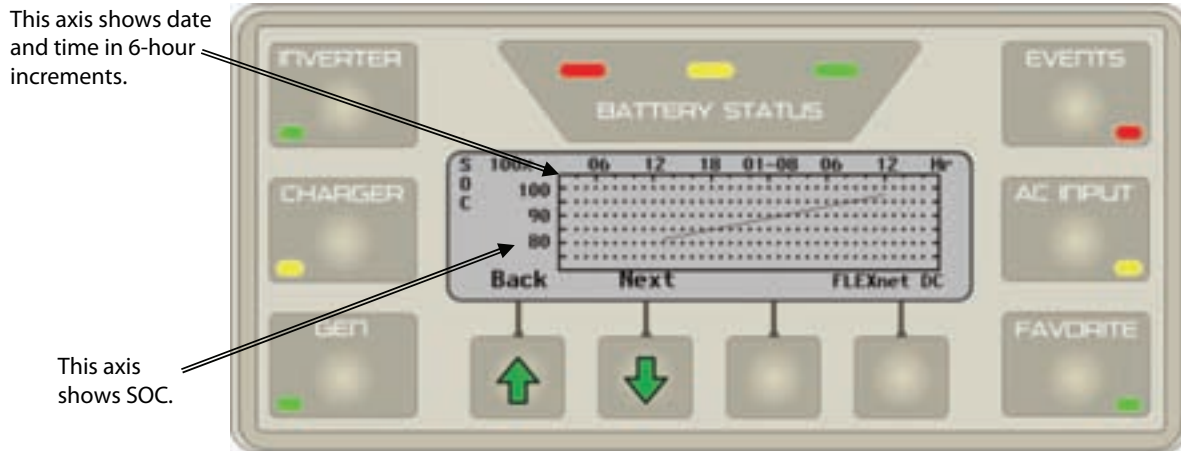
Figure 21   State-of-Charge (SOC) Graph (with FLEXnet DC)

The <**Next**> soft key brings up a screen which shows changes in wattage over time for the first shunt, Shunt A.

This axis shows date and time in 6-hour increments.

This axis shows the wattage readings calculatedfrom shunt A.
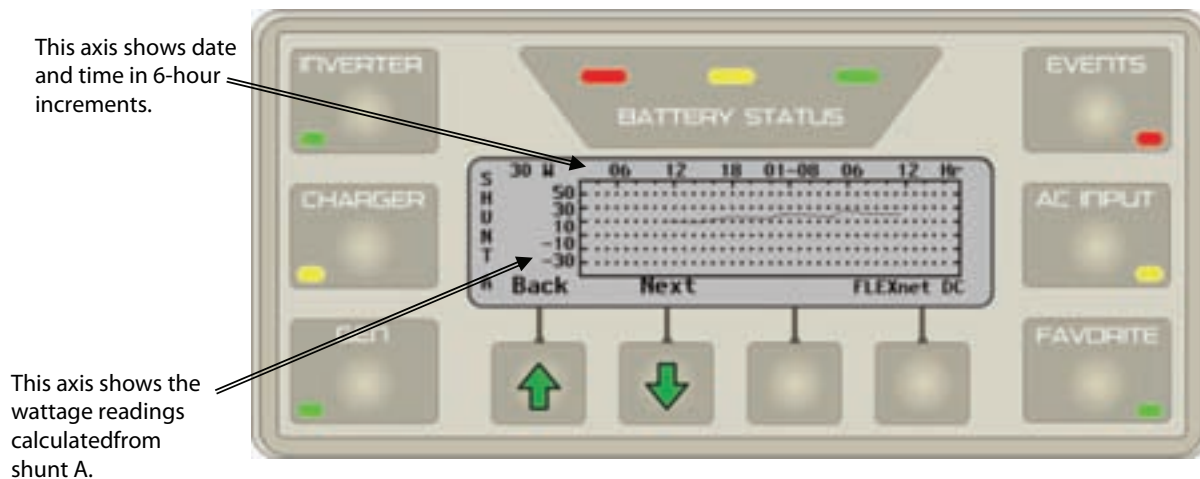
Figure 22   Shunt A Graph (with FLEXnet DC)

Continuing to press the <**Next**> soft key will proceed to Shunts B and C if they have been enabled. (A shunt that is not enabled will not display a graph.) After the shunts have appeared, the <**Next**> soft key will return to the Battery graph.

Inverter Soft Key

Home Screen
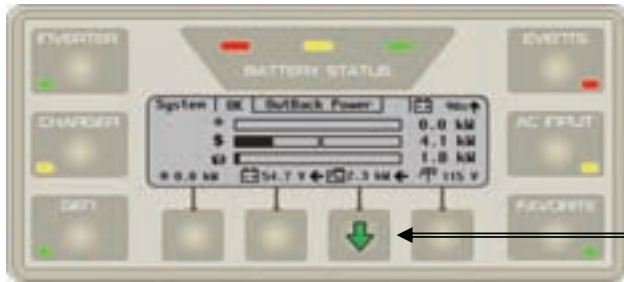
Inverter Soft Key

Press this soft key to view Inverter Status information.

NOTE: Do not mistake the **Inverter** soft key for the **INVERTER** hot key. See page 28 for a comparison between the two.

Inverter Screen

Inverter Modes:

- Inverting
- Searching
- Support
- Sell
- Charging
- Charger Off
- Float
- EQ
- Silent
- PassThru
- Error
- Off

Soft Keys:

<**Next>** brings up a series of screens that show information on the inverter's charger and other battery-related functions, and on any inverter-based warnings or errors that may be present. These screens are shown beginning on page 37.

<**Graph>** brings up a series of screens that plot various battery information over time. The graphs include inverter and charger wattage, power imported from an AC source, battery voltage, and others. These screens are shown beginning on page 40.

<**Port**> cycles through each device connected to the network.

<**Back**> returns to the previous screen.

Screen Items:

The upper left corner of the screen shows the inverter's current mode of operation. All possible modes are listed above. However, available modes may vary with inverter model and system type. See the inverter *Operator's Manual* for details on each mode.

Invert displays the power in kilowatts currently generated by the inverter. This power may go to loads, or in a grid-interactive system, it may be sold back to the utility grid.

Charge displays the power in kilowatts currently consumed for the inverter to charge the battery bank.

Load displays the power in kilowatts currently consumed by devices on the inverter's output. May or may not be the same number as *Invert.*

Buy displays the power in kilowatts brought into the inverter's input for both charging and loads. This usually reads as a total of the *Charge* and *Load* items.

Battery displays the uncompensated battery voltage.

AC Out displays the AC voltage measured at the inverter's output. If an AC source is present, this reading is usually the same as *AC In*.

AC In displays the AC voltage measured at the inverter's input from an AC source.

The lower right corner shows the current status of the inverter's Auxiliary (AUX) output. (See page 83.)

Figure 23   Inverter Soft Key Screens

From the **Inverter** screen, the <**Next>** soft key brings up the Inverter Battery screen.

Inverter Screen

Inverter Battery Screen

Soft Keys:

<**Warn>** brings up a series of screens with a list of non-critical inverter faults and other information. These screens are shown beginning on page 38.
<**Error>** brings up a screen with a list of critical inverter faults. These screens are shown beginning on page 39.

<**Back**> returns to the previous screen.

<**Port**> cycles through each device connected to the network.

Note: If an arrow appears next to the items **Absorb**, **Float**, or **Equalize**, it indicates the charger is in that stage. The arrow will not appear if the charger is in the bulk stage or silent mode.

Screen Items:

Actual displays the uncompensated battery voltage.

Absorb displays the Absorption voltage setting which was programmed into the inverter's charger. During the bulk and absorption stages, this is the target voltage used by the charger.

Float displays the Float voltage setting which was programmed into the inverter's charger. During the float stage, this is the target voltage used by the charger.

Equalize displays the Equalization voltage setting which was programmed into the inverter's charger. During the equalization charging cycle, this is the target voltage used by the charger.

Temp Comp displays the corrected battery voltage after temperature readings are taken into account from the Remote Temperature Sensor (RTS). If no RTS is present, **Temp Comp** and **Actual** will read the same.

Batt Temp displays the battery temperature in degrees Celsius, as measured by the RTS. This reading is only valid for port 1 on the HUB. If other ports are selected, or if no RTS is present, the characters ### will be displayed.

Re-Float displays the Re-Float setting which was programmed into the inverter's charger. This is the voltage used for the inverter to return from silent mode to the float stage.

Figure 24   Inverter Battery Screen

Warning Messages

A Warning message is caused by a non-critical inverter fault. When this occurs, the inverter will not shut down, but will display a fault LED. One or more messages in this menu will change from **N** to **Y**. A warning is also accompanied by an event message (see page 53).

Some warnings can become errors if left unattended. Frequency and voltage warnings are meant to warn of a problematic AC source. See the inverter *Operator's Manual* for more information on troubleshooting a specific warning.

Screen Items

AC Freq Too High: The AC source is above the acceptable frequency limit and prevents connection.

AC Freq Too Low: The AC source is below the acceptable frequency limit and prevents connection.

Voltage Too High: The AC source is above the upper acceptable voltage limit and prevents connection.

Voltage Too Low: The AC source is below the lower acceptable voltage limit and prevents connection.

Input Amps > Max: AC loads are drawing more current from the AC source than allowed by the input setting.

Temp Sensor Bad: An internal inverter temperature sensor may be malfunctioning. This is indicated by an unusual ***Transformer, Output FETs,*** or ***Capacitors*** reading.

Comm Fault: Probable failure on inverter's control board which has interrupted internal communications.

Fan Failure: The inverter's internal cooling fan is not operating properly. Lack of cooling may result in derated inverter output wattage.

Soft Keys:

<**Temps**> brings up a screen which displays the readings for the inverter's internal temperature sensors. One sensor is attached to the main transformer, another is on the heat sink for the Field Effect Transistors (FETs), and one is on the filter capacitors. Normally all three sensors read approximately the same. An unusually high or unusually low reading on one sensor indicates a defective sensor. Contact OutBack Technical Support if necessary (see inside front cover of this manual).

<**Back**> returns to the previous screen.

<**Port**> cycles through each device connected to the network.

Figure 25   Inverter Warnings and Temperatures

Error Messages

An Error message is caused by a critical inverter fault. When this occurs, the inverter will usually shut down and will display a fault LED. One or more messages in this menu will change from **N** to **Y**. An error is also accompanied by an event message (see page 53).

See the inverter *Operator's Manual* for more information on troubleshooting a specific error.
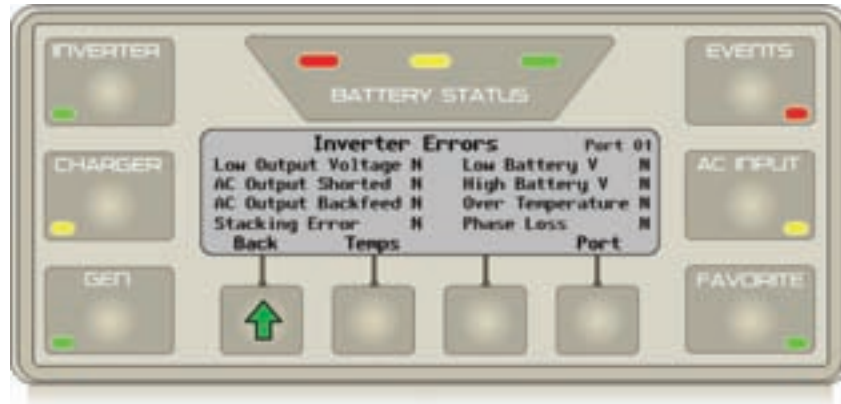
Soft Keys:

<**Back**> returns to the previous screen.

<**Port**> cycles through each device connected to the network.

Screen Items:

Low Output Voltage: The inverter's AC regulation cannot be maintained under high load conditions.

AC Output Shorted: The inverter exceeded its maximum surge current due to severe overload.

AC Output Backfeed: Usually indicates another AC power source (out of phase with the inverter) was connected to the unit's AC output.

Stacking Error: A programming problem among stacked units.   (Often occurs if there is no master.)

Low Battery V: The DC voltage is below the Low Battery Cut-Out (LBCO) set point.

High Battery V: The DC voltage is above the inverter's acceptable level (as specified in the *Operator's Manual*).

Over Temperature: The inverter has exceeded its maximum allowed operating temperature.

Phase Loss: A slave was ordered to transfer to AC by the master, but no AC is present. The unit continues inverting. This is the only "Error" that is not accompanied by a shutdown.

Figure 26   Inverter Errors

From the *Inverter* screen (see Figure 23 on page 37), the <**Graph**> soft key brings up the following screens which plot various type of data over time. The first screen shows changes in wattage produced by the inverter over time.
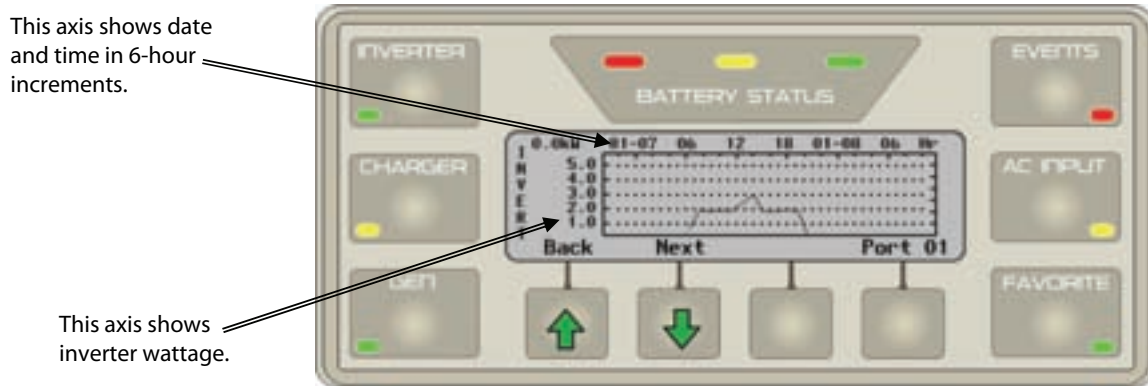
Figure 27   Inverter Graph

The <**Next**> soft key brings up a screen which shows changes in wattage produced by the battery charger over time.
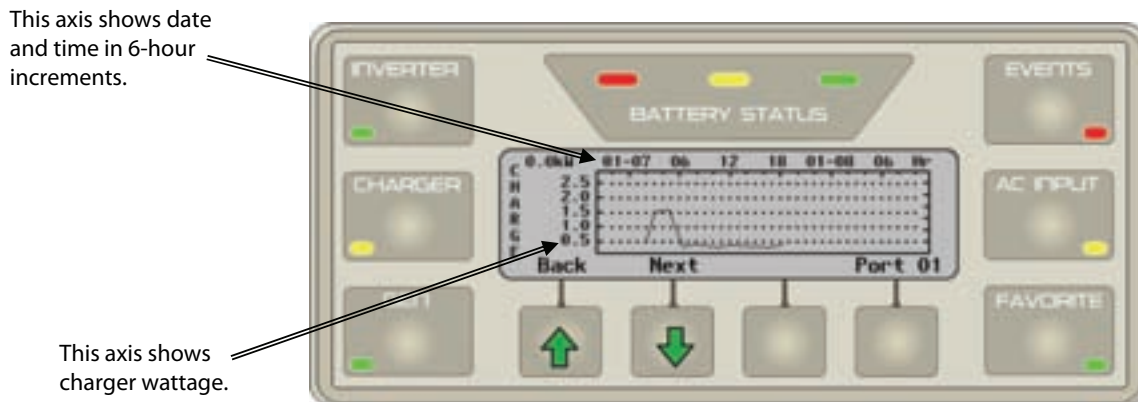
Figure 28   Charge Graph

The <**Next**> soft key brings up a screen which shows changes in wattage imported by the inverter system from an AC source (bought) over time.
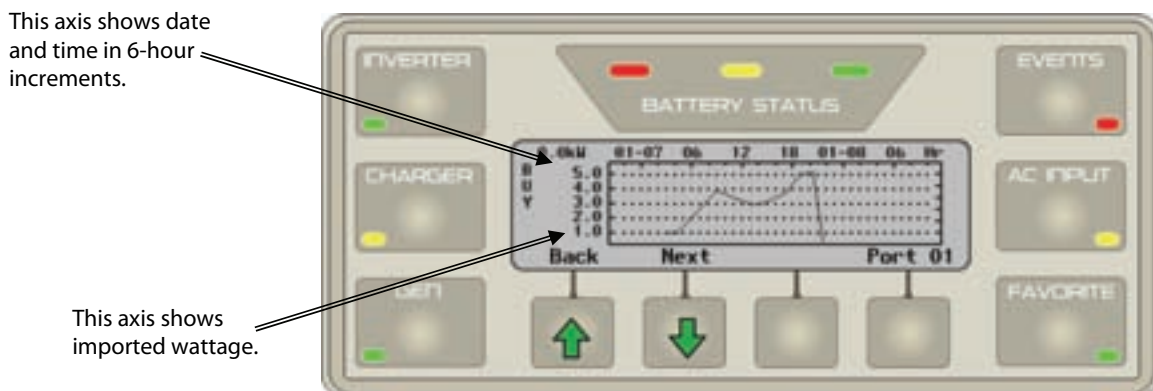
Figure 29   Buy Graph

The <**Next**> soft key brings up a screen which shows changes in wattage sold to the utility by a grid-interactive system over time.

This axis shows date and time in 6-hour increments.

This axis shows sold wattage.
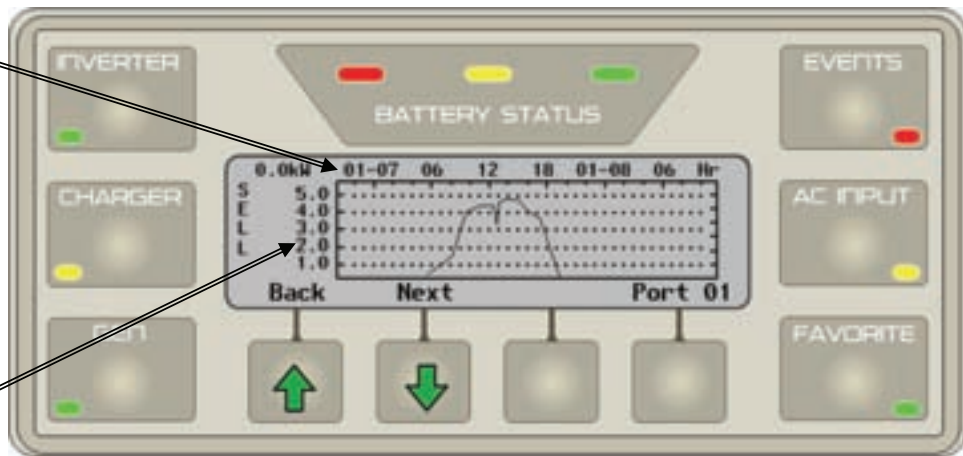
Figure 30   Sell Graph

The <**Next**> soft key brings up a graph showing changes in battery voltage over time. This is the same graph shown on pages 30, 35, and 45.

This axis shows date and time in 6-hour increments.

This axis shows battery voltage.
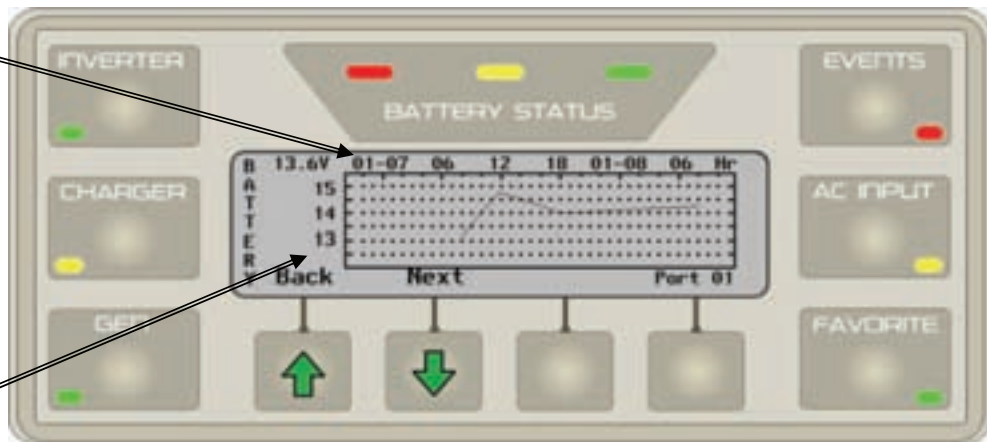
Figure 31   Battery Graph

Continuing to press the <**Next**> soft key will proceed through the same graphs again from the beginning.

Charge Controller Soft Key

Charge Controller Soft Key

Press this soft key to view FLEXmax charge controller status information. If no charge controller is present, the PV icon will be blank and this soft key will be inoperative.

Charge Controller Modes:

➢ Bulk
➢ Absorb
➢ Float
➢ EQ
➢ Silent

Screen Items:

The upper left corner of the screen shows the FLEXmax charge controller's current mode of operation. **Silent** is shown in this illustration. All possible modes are listed to the right of the illustration. See the charge controller *User's Manual* for descriptions of each mode.

In displays the present PV array operating voltage and the current being harvested from the array.

VOC displays the present PV open-circuit voltage.

Out displays the present battery voltage and the current being delivered from the charge controller(s) to charge the battery bank.

Operating displays the total hours the charger has operated that day in any stage.

Float displays the run time of the float timer when in float stage.

Absorb displays the run time of the absorption timer when in absorption stage.

Maximum displays the maximum amperage and wattage harvested from the PV array that day, and the time both were recorded.

The lower right corner shows the current status of the charge controller's Auxiliary (AUX) output. (See page 98.)

Soft Keys:

<**Datalog**> brings up a group of charge controller statistics that are maintained as a continuous daily log. These screens are all shown beginning on page 43.

<**Graph**> brings up a series of screens that plot various charge controller information over time. The graphs include inverter and charger wattage, power imported from an AC source, battery voltage, and others. These screens are all shown beginning on page 44.

<**Port**> cycles through each device connected to the network. If more than one charge controller is installed in the system, pressing the **<Port>** soft key will cycle through each controller.

<**Back**> returns to the previous screen.

Figure 32   Charge Controller Soft Key Screens

DataLog Screen

The <**Datalog**> soft key shows accumulated daily amp-hour and watt-hour statistics, as well as maximum current, wattage, and maximum and minimum voltage figures. These maintain a continuous daily log, up to 128 days, which can be recalled. One day can be displayed at a time.
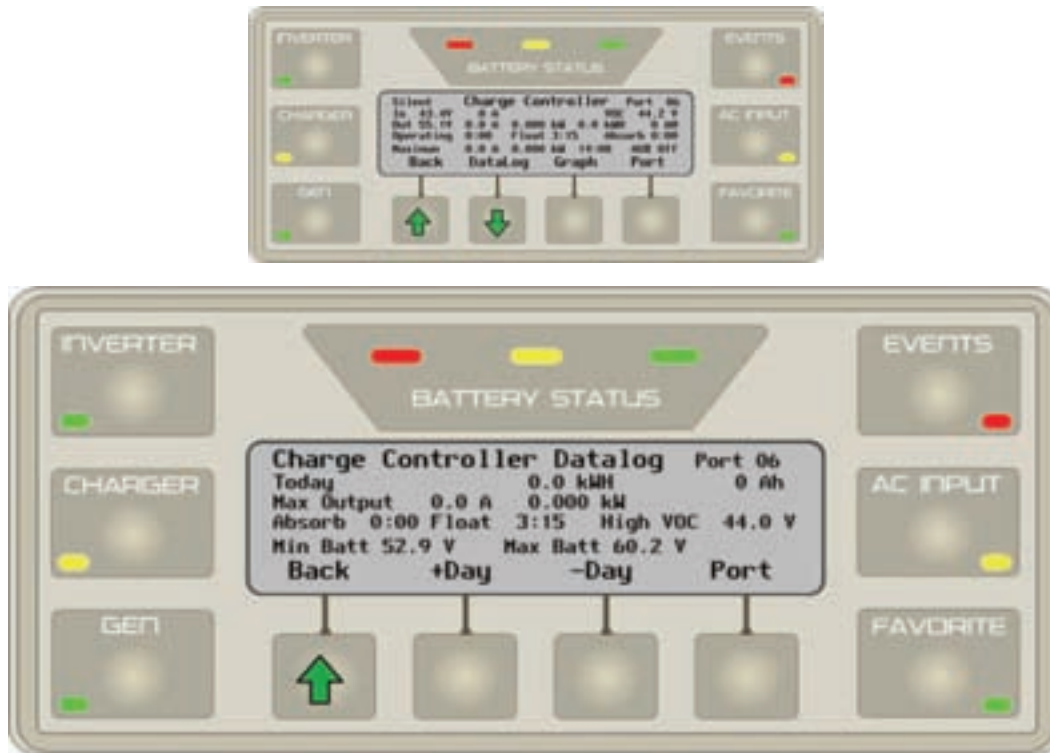
Screen Items:

The item in the upper left corner shows the date of the selected Datalog screen. (The current Datalog screen reads "Today.") To the right, this line also displays the kilowatt-hours and amp-hours accumulated that day.

Max Output displays the maximum current and wattage recorded that day.

Absorb The amount of time the absorption timer ran that day.

Float The amount of time the Float timer ran that day.

High VOC displays the highest open-circuit voltage (VOC) recorded that day.

Min Batt displays the lowest battery voltage recorded that day.

Max Batt displays the highest battery voltage recorded that day.

Soft Keys:

<**+Day**> advances the display forward by a single day. If the display reads "Today", it does nothing.

<**–Day**> advances the display backward by a single day and will display the selected date.

<**Back**> returns to the previous screen.

<**Port**> cycles through each device connected to the network.

Figure 33   DataLog Screen

Graph Screens

The **<Graph>** soft key brings up the following screens which plot various type of data over time. The first screen shows changes in PV wattage over time.

This axis shows date and time in 6-hour increments.

This axis shows PV wattage.
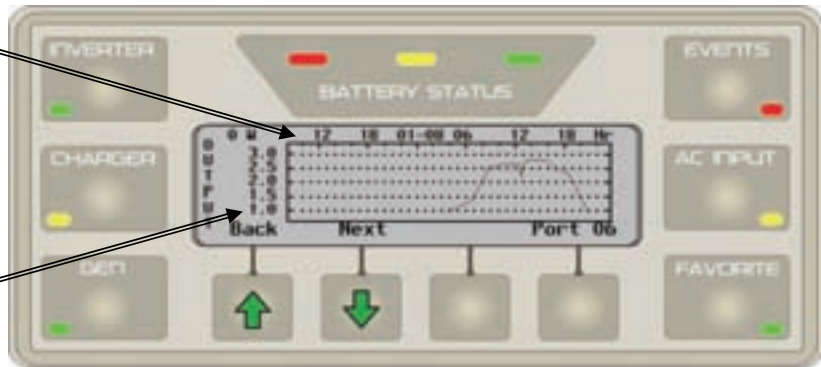
Figure 34   Output Graph

The **<Next>** soft key brings up a screen showing changes in battery voltage over time. This is the same graph shown on pages 30, 35, and 42.

This axis shows date and time in 6-hour increments.

This axis shows battery voltage.
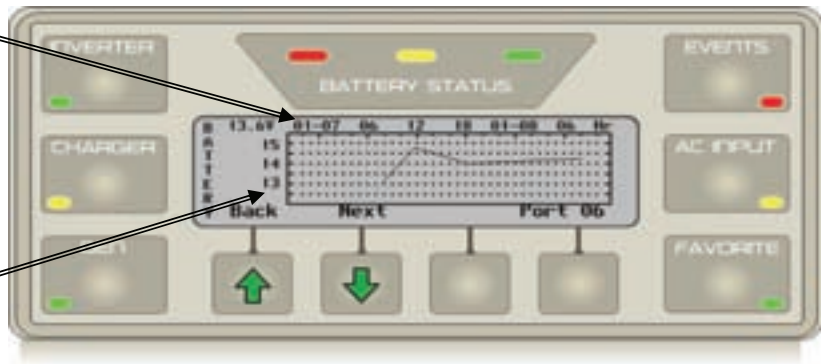
Figure 35   Battery Graph

The **<Next>** soft key brings up a screen showing changes in PV voltage over time.

This axis shows date and time in 6-hour increments.

This axis shows PV voltage.
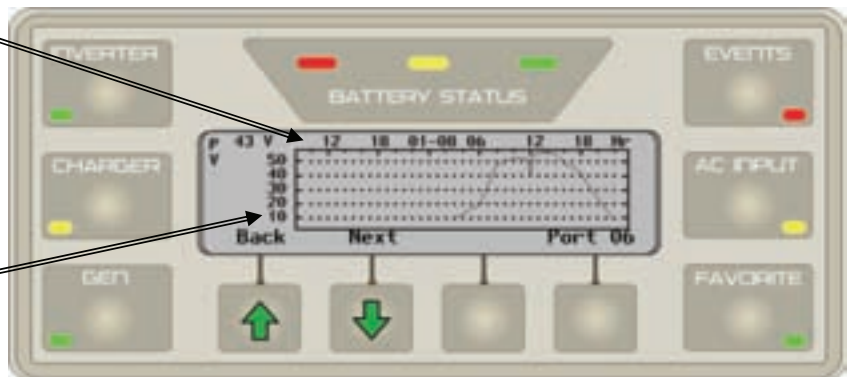
Figure 36   PV Graph

Continuing to press the <**Next>** soft key will proceed through the same graphs again from the beginning.

Grid Soft Key

Grid Soft Key

Press this soft key to view utility grid status information.

Screen Items:

Grid displays the current AC voltage from the utility grid.

Min displays the lowest recorded AC voltage that day, and the time it was recorded.

Max displays the highest recorded AC voltage that day, and the time it was recorded.

Mode displays the inverter's current operating status (either buying or selling) and the number of kilowatts being bought or sold. This status will be blank if grid power is not present.

Soft Keys:

<**Sell Status**> brings up a group of messages indicating possible reasons for the inverter to fail to sell to the utility grid.

<**Back**> returns to the previous screen.

<**Port**> cycles through each device connected to the network.

Figure 37   Grid Soft Key Screens

Screen Items:

Selling Disabled: The **Grid-Tie Enable** command has been set to *N* (no). See page 88.

*Qualifying Grid:* The inverter is running a timed test during which it analyzes the grid quality. The timer is shown on the screen. (If the inverter is not a grid-interactive model, a random number may be displayed.) The timer duration is listed in the inverter *Operator's Manual.*

Frequency Too Low/Too High, Voltage Too Low/Too High: The frequency or voltage are outside the acceptable limits for that model of inverter. The *Operator's Manual* lists that model's acceptable frequency and voltage range.

Battery <= xxxx: The battery voltage is below the target voltage for that stage (Float, SellRE, etc). No excess energy is available to sell.

AC2 (gen) Selected: The **Input Type** command has been set to **Gen**. The inverter will not knowingly sell to a generator. See page 76.

Soft Keys:

<**Back**> returns to the previous screen.

<**Port**> cycles through each device connected to the network.

Figure 38   Sell Status Screen

Hot Keys

Six hot keys are available to facilitate navigation through the most commonly used operational screens. Some screens will have operational options, such as ON, OFF, or AUTO, as well as show current operational status for that function. Status, mode, and measurements are the collective status of the system, not of an individual inverter, unless specified otherwise.

INVERTER Hot Key ————

CHARGER Hot Key ————

GEN Hot Key ————

———— EVENTS Hot Key

———— AC INPUT Hot Key

———— FAVORITE Hot Key

Figure 39   Navigating with the Hot Keys

INVERTER Hot Key

The INVERTER hot key displays the **Inverter Status** screen. The **Inverter Status** screen displays the current inverter mode, input and output voltage and current, battery voltage, and load draw.

INVERTER
Hot Key

The INVERTER hot key can also be used to turn the inverter on or off. This is a global command issued to all inverters.

NOTE: Do not mistake the **Inverter** soft key for the INVERTER hot key. See page 28 for a comparison between the two.

Screen Items:

Mode displays the setting selected by the soft keys (**<ON>**, **<OFF>**, or **<Search>**).

Battery displays the battery voltage, not compensated for temperature. (See page 37 for the compensated value.)

Input displays the AC input source voltage and the power in kW drawn from the AC source.

Output displays the voltage measured at the inverter's output and the power in kW produced by the inverter. The inverter's produced power may equal the load wattage, but it may also include power sold to the grid (in grid-interactive inverters).

Load displays the power in kW delivered to the inverter's output.

Soft Key Options:

<Back> returns to the Home screen.

<ON> turns the inverter ON.

<OFF> turns the inverter OFF.

<Search> toggles the Search mode *ON* or *OFF*.

Figure 40   Using the INVERTER Hot Key

CHARGER Hot Key

The CHARGER hot key displays the **Charger Status** screen. The **Charger Status** screen displays the current charger mode, battery voltage, absorb and float voltage settings and timers. Soft key options include starting or stopping the charger, which is a global command issued to all inverters in the system. Other options include starting or the bulk or equalization charge functions, which are global command issued to all inverters and charge controllers in the system.

NOTE: The charging information displayed on this screen is for inverters only. Note also that if an inverter or charge controller has a different charging status from the master inverter, this screen will not display its status.

CHARGER Hot Key
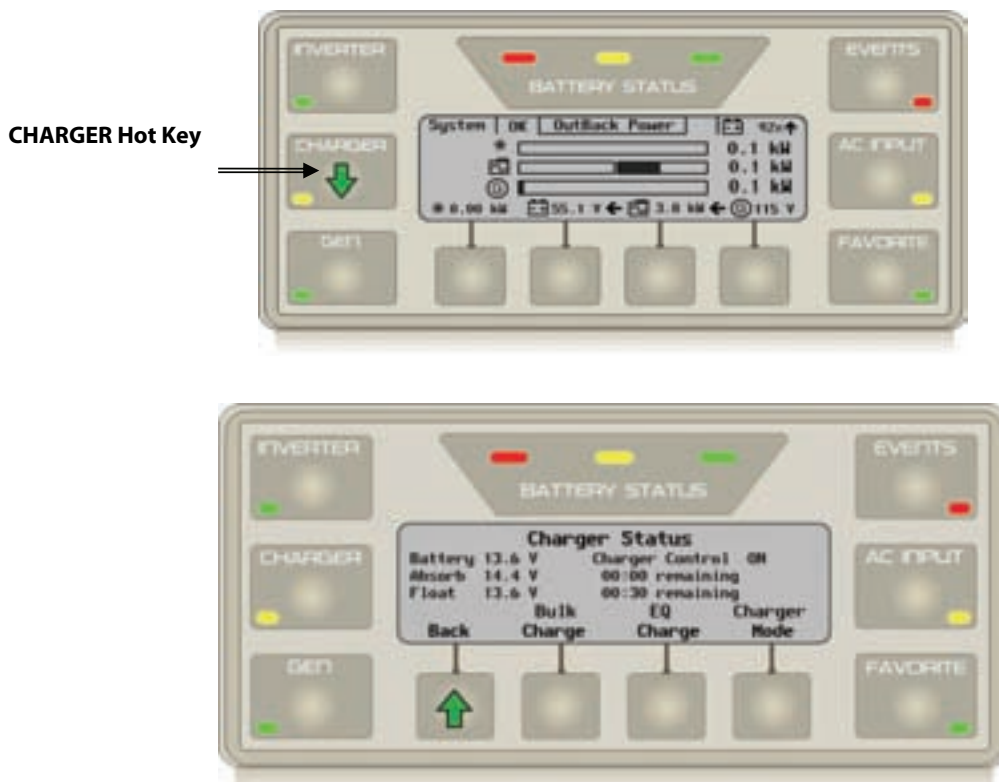
Screen Items:

Battery displays the uncompensated battery voltage.

Charger Control displays the mode of the charger.

Absorb displays the target voltage for the Bulk and Absorption stages. If the timer to the right of either item is running, the system is in that charging stage.

Float display the target voltage for the Float stage.

Soft Key Options:

<Back> returns to the Home screen.

<Bulk Charge> advances to the **Bulk Charge** screen to start a new charging cycle.

<EQ Charge> advances to the **Equalize Charge** screen.

<Charger Mode> advances to the **Charger Mode** screen to enable or disable the charger.

Figure 41   CHARGER Hot Key

IMPORTANT:
Equalization should only be performed on certain kinds of batteries under specific conditions. Pressing the **<Start EQ>** soft key will bring up several recommendations and confirmations to ensure this function is not started accidentally.

From the CHARGER hot key's *Charger Status* screen, the **<Bulk Charge>** soft key brings up a screen that can start or stop the bulk stage of a new charging cycle.

Soft Key Options:

<Start Bulk> starts a new charging cycle.

<Stop Bulk> stops a charging cycle once started.

Screen Items:

The screen will display Bulk Charge Started when the **<Start Bulk>** soft key is pressed.

The screen will display Bulk Charge Stopped when the **<Stop Bulk>** soft key is pressed.

Figure 42   Using the CHARGER Hot Key (Bulk Charge)

From the CHARGER hot key's *Charger Status* screen, the **<EQ Charge>** soft key brings up a series of screens that can enable the battery equalization process.

Screen Items:

Battery displays the uncompensated battery voltage.

Equalize (below *Battery*) displays the target voltage for the Equalization stage.   The timer to the right of this item begins running once this voltage is reached.

Equalize (right side of screen) displays whether this mode is enabled or disabled.

Last EQ charge displays the time and date for the most recent equalization cycle.

Soft Key Options:

<Back> returns to the *Charger Status* screen.

< Start EQ> starts the equalize charging stage.

< Stop EQ> stops the equalize charging stage.

Soft Key Options:

<Back> returns to the *Equalize Charge* screen.

<Next> advances to the confirmation screen.

Soft Key Options:

<Exit> returns to the *Charger Status* screen.

< Yes> begins the equalization process and simultaneously returns to the *Equalize Charge* screen. The process can be stopped by pressing the **< Stop EQ>** soft key on that screen.

Figure 43   Using the CHARGER Hot Key (EQ Charge)

From the CHARGER hot key's **Charger Status** screen, the **<Charger Mode>** soft key brings up a screen that can enable or disable the charger. (See the inverter *Operator's Manual* for a description of specific charger functions.)
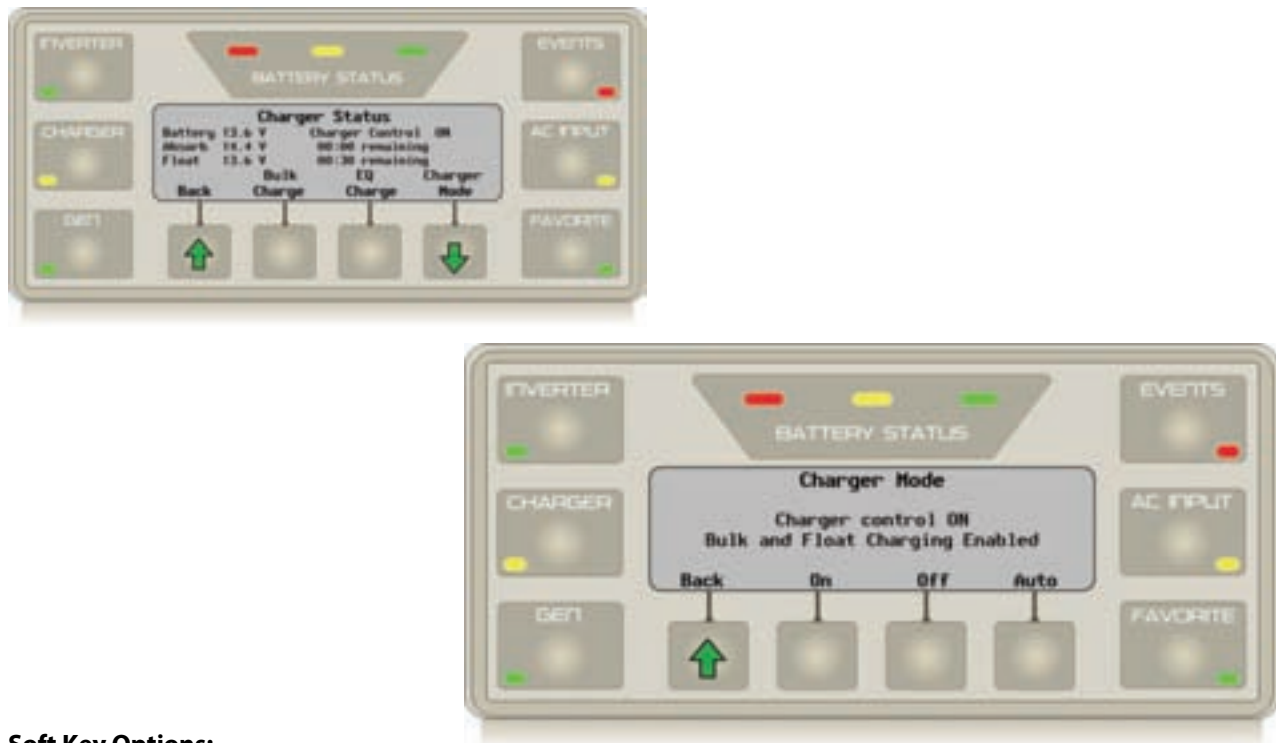
Soft Key Options:

<On> enables the charger for a charge cycle consisting of bulk , absorption and float stages. Upon completion, the charger remains in the float stage to maintain the batteries until the AC input is disconnected.

Note: In OutBack grid-interactive inverters, this charging cycle is automatically selected when the ***Input Type*** menu is set to Gen (see page 78.) The **<On>** option cannot be selected if the menu is set to Grid. In these inverters, the Charger Mode menu can still enable or disable the charger, but it cannot select the cycle.

<Off> disables the charger.

<Auto> enables the charger for a charge cycle consisting of bulk , absorption and float stages. Upon completion, the charger goes into silent mode until it reaches the "re-float" voltage, when it will re-enter the float stage.

Note: In OutBack grid-interactive inverters, this charging cycle is automatically selected when the ***Input Type*** menu is set to Grid (see page 78). This option cannot be selected if the menu is set to Gen. In these inverters, the Charger Mode menu can still enable or disable the charger, but it cannot select the cycle.

Screen Items:

When **<On>** is selected, the screen will display Charger Control ON.
Bulk and Float Charging Enabled.

When **<Off>** is selected, the screen will display Charger Control OFF.
All Inverter Charging Disabled.

When **<Auto>** is selected, the screen will display Charger Control AUTO.
Automatic Charging Enabled.

Figure 44   Using the CHARGER Hot Key (Charger Mode)

GEN Hot Key

The GEN hot key displays the *Generator Status* screen. The *Generator Status* screen displays information on the Advanced Generator Start (AGS) mode. Soft key options include <**AUTO**>, <**OFF**>, and <**ON**>.

GEN Hot Key →

Screen Items:

The figure to the left of the title displays the accumulated generator run time. This counter can be reset. (See page 124.)

Mode displays the setting selected by the soft keys (<**ON**>, <**OFF**>, or <**Auto**>). If the function is not enabled (see page 114), it will read *AGS DISABLED*.

Status displays the current status of the AGS function. If not operating the generator, it reads *OFF*. If active, it may read *STARTING* or *RUN*.

Fault displays the message *AGS Fault* if the generator voltage is lost. Otherwise, it displays *NONE*.

Last Run displays the time and date of the last generator start (on the right side of the screen), as well as the reason.

Soft Key Options:

<**Back**> returns to the Home screen.

< **Auto**> allows the generator to start based on automatic starting parameters set by the user in the AGS menu.

< **Off**> manually stops the generator.

<**On**> manually starts the generator.

Figure 45   Using the GEN Hot Key

When <**On**> is pressed, generator data appears on the right side of the screen.

➢ The first line displays the generator's AC voltage and the number of kilowatts being used from the generator.

➢ The second line displays the updated status *RUN*, the length of time since the start command was sent, the battery state of charge (*SOC*), and the battery voltage. *(If no battery monitor is present, the SOC field will be blank.)*

➢ The third line displays the present charging stage.

Note: The generator can only be started if the AGS mode is enabled in *AGS Setup* (see page 116).   If it is not enabled, this information will not appear.

Figure 46   GEN Hot Key and AGS

EVENTS Hot Key

The EVENTS hot key displays the **Events Status** screen. An event is defined as a fault in one device on the HUB that may or may not have caused a system shut down.

➢ All events are accompanied by the red LED.

➢ If the event is an inverter-based warning, the LED will flash.

➢ If the event is an inverter-based error, then the LED will be on solid.   Errors are usually accompanied by the inverter shutting down. Some warnings can become errors if left unattended.

➢ Finally, the message titled AGS Fault is based in the MATE3. This fault usually indicates an automatic generator problem and is not accompanied by an inverter shutdown. (However, the LED will be on solid.)

➢ Other events may be possible.

➢ Multiple events may occur simultaneously.

Soft key options include scrolling through each event and displaying details about that event to determine if corrective action is required. Events may require acknowledgement before the EVENTS LED will turn off.

See page 37 to view the **Inverter Warnings** and the **Inverter Errors** menus. See the inverter *Operator's Manual* for descriptions of errors, warnings, and other troubleshooting.

EVENTS **Hot Key**

Error – Solid

Warning - Flashing
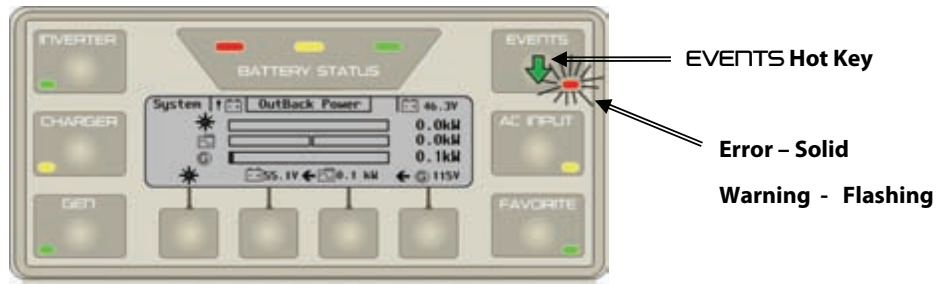
Screen Items:

The left side of the screen lists the nature of the event.

The word **Fault** will appear on the right side of the screen if the event requires acknowledgement.

Soft Key Options:

<Back> returns to the Home screen.

< Next> highlights the next event in the list.

< Prev> highlights the previous event in the list.

<Detail> displays a screen showing the details of the selected event, and prompting for acknowledgement if necessary.

Soft Key Options:

<Back> returns to the **Event Status** screen.

<Ack> and **<Ack All>** If these soft keys appear, either must be pressed to acknowledge the event. **<Ack>** will acknowledge one open event; **<Ack All>** will acknowledge all open events. The EVENTS LED will turn off. An acknowledgement (**Acked**) will appear in the **Event Status** screen.

Figure 47   Using the EVENTS Hot Key

AC INPUT Hot Key

The AC INPUT hot key displays the **AC Input Status** screen. The **AC Input Status** screen displays the AC input mode, the AC input status, and the current AC frequency and voltage. Soft key options include manually using or dropping the AC input source or viewing the **Last AC Disconnect** screen. The **Last AC Disconnect** screen indicates the reason the AC source may have been disconnected.

AC INPUT Hot Key

Screen Items:

AC Input Mode allows soft key options to be selected to change the mode. This item may be overridden by other commands. For example, a system that is set to **DROP** will automatically switch to **USE** if AGS starts the generator.

AC Input Status displays the current interaction with the AC input. This screen will usually change to match **AC Input Mode** once a soft key command is given.

Soft Key Options:

<Back> returns to the Home screen.

< Drop> manually disconnects the system from the AC source.

< Use> instructs the inverter to use the AC source if the AC source meets qualification parameters.

<Discon> displays a screen that shows the reason for the last AC disconnect .

Figure 48   Using the AC INPUT Hot Key

Soft Key Options:

<Back> returns to the **AC Input Status** screen.

<**Port**> cycles through all the devices connected to the HUB.

Figure 49   Disconnect Reasons

FAVORITE Hot Key

The FAVORITE hot key allow the user to program and select often-used screens for rapid access. It includes a green LED.
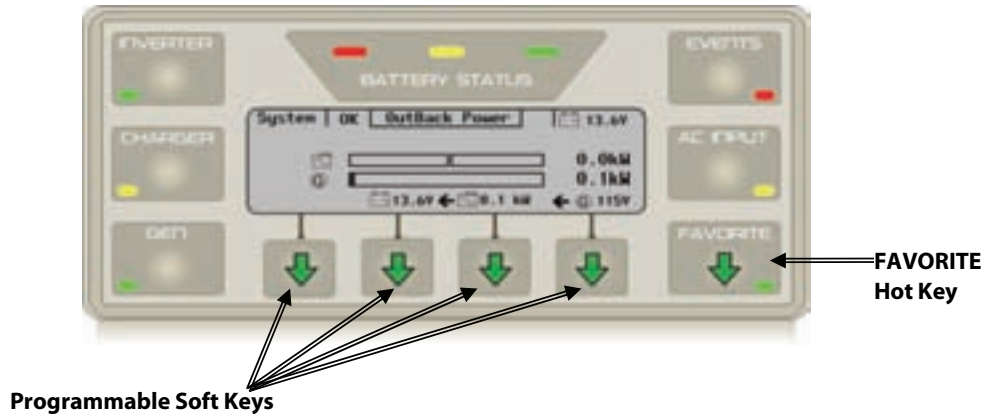
Figure 50   Using the FAVORITE Hot Key

When the FAVORITE hot key is held down for several seconds, the green LED will flash. At that time, the user can press any of the four soft keys to record the current screen for rapid recall.

Figure 51 is an example of rapid recall of the *Inverter Warnings* screen. The user should first navigate to this screen, then hold down the FAVORITE key for several seconds. Once the green LED flashes, the user can press any soft key (the far left key, in this example). After this is done, the green LED will turn off.

When FAVORITE is pressed again briefly, the green LED will turn on. The user can then press the same soft key and the display will jump to the selected screen (*Inverter Warnings*, in this example).

Figure 51   FAVORITE Example #1

Figure 52 is an example of rapid recall of a second screen, the *AC Input Status* screen. Just as in the previous example, the user navigates to the appropriate screen and holds down FAVORITE until it flashes. Since the far left key was used for *Inverter Warnings*, the user presses the second key for *AC Input Status*. When FAVORITE is pressed again briefly, the user can press the second soft key to recall *AC Input Status*.

This function can be used for up to four screens, one per soft key. Only hot key screens or sub-menus can be programmed as Favorites.

Attempting to reuse a soft key to program a fifth screen will simply delete the old screen for that soft key and replace it with the new one.

Figure 52   FAVORITE Example #2

Controls and Navigation Keys

Removing the Front Cover
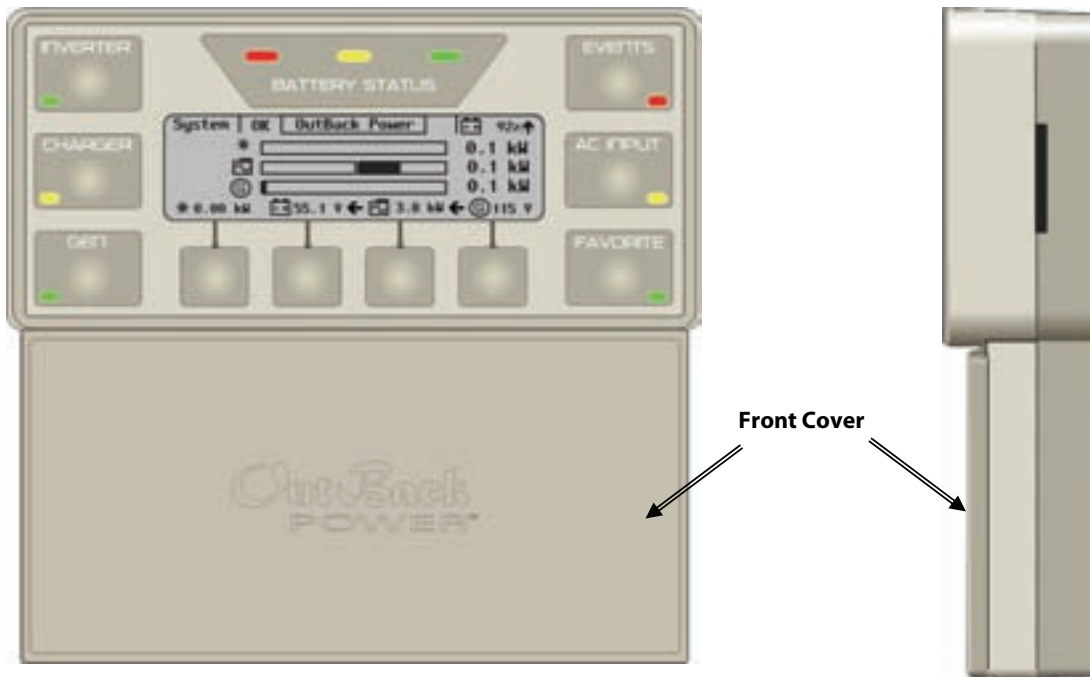
To Remove the Front Cover:

1. Gently pull on the front cover. The navigation panel is magnetic and the front cover will pull off with a small amount of force.

To Replace the Front Cover:

1. Place the front cover over the navigation section.

2. Allow the magnets to pull the front cover in place.

Figure 53   Removing the Front Cover
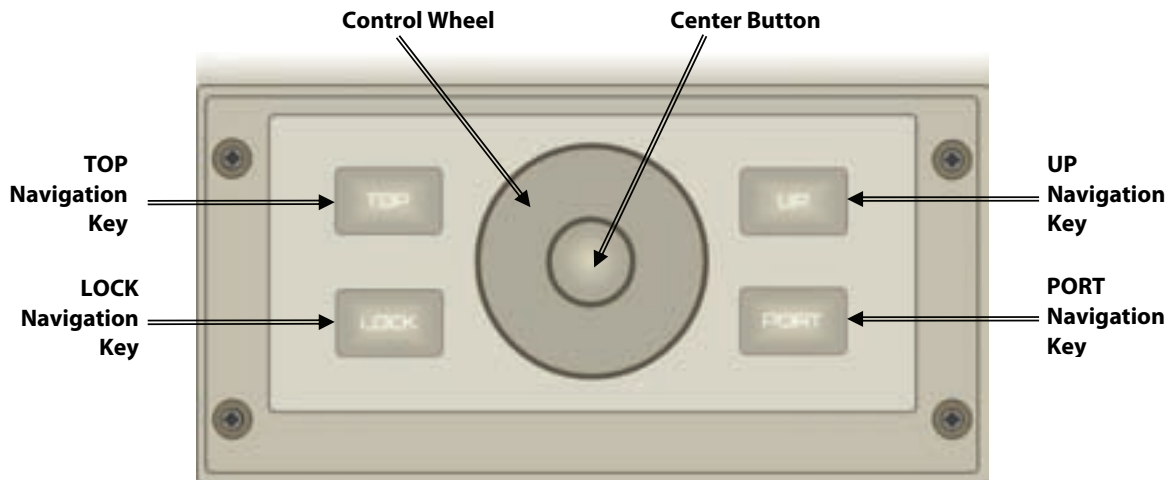
Figure 54   Navigation Controls

Navigation Keys (buttons)

➢ The TOP navigation key returns the operator to the top of the Main Menu for the selected device. From the Main Menu, the TOP key returns the operator to the Home screen.

➢ The LOCK navigation key locks the access to prevent unauthorized changes to the system settings.

➢ The UP navigation key moves the operator up or back one screen in the menu map for the selected device.

➢ The PORT navigation key cycles through each device connected to a port on the HUB.

Control Wheel

➢ The Control Wheel scrolls forward or backward in the menu map. It also increases or decreases the set point value.

➢ The center button inside the control wheel enters, or accepts, the option or set point that is highlighted in the LCD.

➢ Touch the wheel anywhere and make a circular motion around the wheel.

  ~   Clockwise scrolls forward.
  ~   Counter-clockwise scrolls backward.

To scroll down to the next menu or increase the value of the setting:

➡ **Touch the control wheel and make a clockwise circle.**

To scroll up to the previous menu or decrease the value of the setting:

➡ **Touch the control wheel and make a counter-clockwise circle.**

To select the option or setting value:

➡ **Press the button in the center of the control wheel.**

Figure 55   Using the Control Wheel

Programming

Programming an OutBack system may involve the following settings.

➢ Establishing **System** settings (page 61). These include:

➢ Programming **Inverter** parameters (page 75). These include:

➢ Setting **Charge Controller** Limits (page 94). These include:

➢ Setting **Battery Monitor** parameters (page 106). These include:

➢ Programming user features in the **MATE3** system display and control. (page 112) These include:

Accessing the Main Menu

Programming the system is done in the Main Menu screen. A password is required to access the Main Menu screen. This password, **141**, cannot be changed.

To access the Main Menu, enter the password as follows:

1. Press the LOCK button.

2. While touching the control wheel, make a clockwise circle until the display shows **141**.

3. Press the center button on the control wheel to accept the password.

| ① Press the LOCK button. | ② Make a clockwise circle until the display shows **141**. | ③ Press the center button. |

If access to menus has been restricted by an installer or OEM, the Installer Password can be entered from this menu to allow full access. Press the <**UP**> soft key to enter the Installer Password. The default Installer Password is **1732**. This password can be changed. See page 71.

Figure 56   Accessing the Main Menu; Entering the Password

Main Menu

All programming menus are accessed from the ***Main Menu*** Screen. Menus include the following:

➢ ***Settings*** (System, Inverter, Charge Controller, Battery Monitor, MATE3)
➢ ***Configuration Wizard*** (TBD)
➢ ***Data Logs*** (TBD)
➢ ***Event Logs*** (TBD)
➢ ***Software Updates***

Each menu has its own set of Menu Options. Each Menu Option has its own set of Menu Items.

Main Menu Screen

In this example, the Main Menu has 5 menus available.

The Settings Menu is selected.

Use the control wheel to scroll through the menus.

Press the button in the center of the control wheel to accept the selection.

Menu Option

In this example, the Settings Menu has 5 menus available.

The System Menu option is selected.

Use the control wheel to scroll through the menus.

Press the button in the center of the control wheel to accept the selection.

Menu Item

In this example, the System Configuration menu option has more than 5 menus available as indicated by the scroll bar on the left of the screen.

The System Information menu item is selected.

Use the control wheel to scroll through the menus.

Press the button in the center of the control wheel to accept the selection.

Indicates more menus are available by scrolling down.

Figure 57   Menu Structure

Set Points
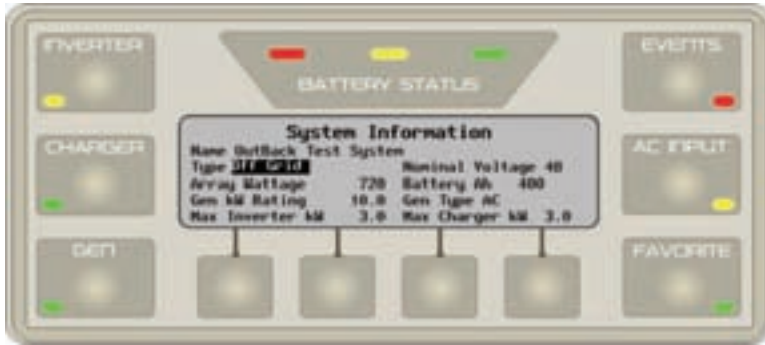
> Set points are adjustable settings for each specific menu item.

> Set points will vary depending on the system configuration.

> Set points are highlighted when adjustments are available. Use the control wheel to increase or decrease the set point values.

Figure 58   Set Points

Settings Menus

> The system **Settings** menus are used for programming functions for the overall system (e.g., date & time, communication options).

> The device **Settings** menus are used to program the various system components (e.g., inverter, charge controller, battery monitor, and MATE3 system display and control.

> The **Settings** menus are accessed in the **Main Menu** using the ⌷⌷⌷ key.
> See Figure 56 on page 60 for instructions on entering the **Main Menu**.

IMPORTANT:
If multiple inverters are used in the installation, make certain to change settings as appropriate for each inverter on its assigned port. Changing settings for a single inverter in a multiple-inverter system may result in conflicts in operation.

Settings Menu	See pages....	Notes
System	63 to 72	
Inverter	75 to 93	See the inverter *Operator's Manual* for details about functional features of the inverter.
Charge Controller	95 to 105	Detailed information about basic setup for a FLEXmax charge controller is available in the *FLEXmax 60/80 Charge Controller User's Manual*.
Battery Monitor	106 to 111	Detailed information about basic setup for a FLEXnet DC is available in the *FLEXnet DC User's Manual*.
MATE3	112 to 133	

System Settings

System Settings menu option include the following menu items:

To access the *Settings Menu* Option:

1. "**Settings**" is the first menu to appear on the list. It should be highlighted first by default. However, if required, use the control wheel to scroll down or up until the desired menu is highlighted.

2. Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel again to highlight **System**.

4. Press the button in the center of the control wheel to accept the selection.
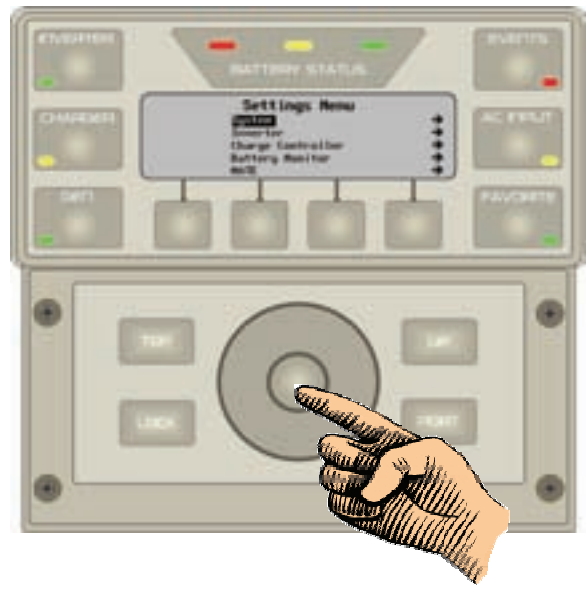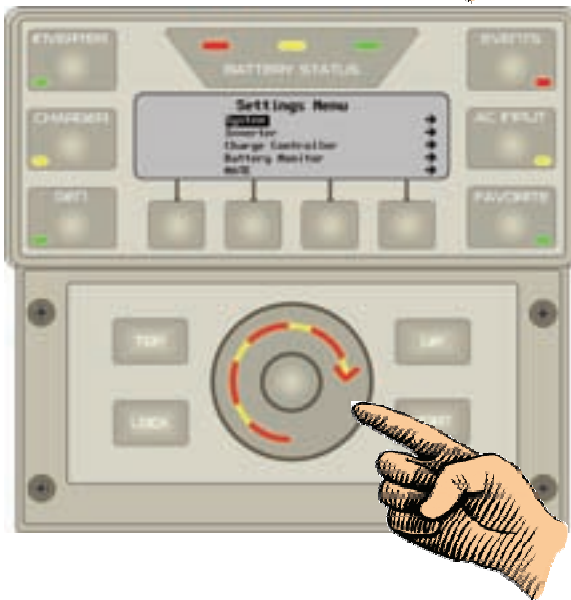
Figure 59   Accessing the Systems Settings Menu

System Information

The System Information screen contains basic information on the elements of the system.

- ➢ System name
- ➢ Type of system (Off Grid, Grid Tied, AC Coupled, Backup)
- ➢ Nominal voltage of the battery bank
- ➢ Array wattage (PV)*
- ➢ Battery amp-hours
- ➢ Generator kW rating* and type
- ➢ Inverter and charger kW rating*

*Used to scale the Home screen meter bars.

To access the *System Information* menu item:

1. Access the **Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight **System**.
   Press the button in the center of the control wheel to accept the selection.
   This will bring up the **System Configuration** menu.

3. The screen will appear with **System Information** automatically highlighted by default.
   Press the button in the center of the control wheel to accept the selection.
   This will bring up the **System Information** menu.

4. Use the control wheel to change the value of the highlighted set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

5. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu**.

Figure 60   System Information Menu Item

Set Points:

- ➢ **Type** – Off Grid, Grid Tied, AC Coupled, Backup. Each type causes a different Home screen to be displayed. See page 25 for details on these types and their respective Home screens.
- ➢ **Nominal Voltage** – Allows for a battery bank with a voltage of 12, 24, 32, 48 or 60 Vdc.
- ➢ **Array Wattage** – Allows for a PV Array(or arrays) with a total wattage range of 0 to 50 kW.
- ➢ **Battery amp-hours** – Allows for total amp-hour rating of the batteries from 25 Ah to 10,000 Ah.
- ➢ **Generator kW Rating** – Allows for a generator with a range of 0 to 250 kW.
- ➢ **Generator Type** – Allows for an AC or DC Generator.
- ➢ **Maximum Inverter kW Rating** – Allows for an inverter system with a wattage of 0 to 72 kW.
- ➢ **Maximum Charger kW Rating** – Allows for a system with a total charger rating of 0 to 60 kW.

Date & Time

IMPORTANT:
➢ Some features are dependent on time and date settings. Be sure to adjust these settings for the proper time and date for your location.
➢ The MATE3 clock does not automatically adjust for daylight savings time.
➢ The MATE3 **does** automatically adjust for leap year.

To access the *Date & Time* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **Date & Time** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the value of each set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **System Configuration** screen.

Figure 61   Date & Time Menu Item

Set Points:

➢ Hour (1 to 23)
➢ Minutes (00 to 59)
➢ Day (1 to 31)
➢ Month (Jan to Dec)
➢ Year (2010+)

LCD Display

Ambient lighting and personal eyesight varies with every installation. Therefore, the contrast, color, brightness, backlighting, and auto time-out of the LCD can be adjusted to provide the best visibility for a given location.

To access the *LCD Display* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **LCD Display** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the value of each set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **System Configuration** screen.

Figure 62   LCD Display

Set Points:

➢ **Contrast** – Range = 1 to 100, from lowest contrast to highest contrast.

➢ **Color** – Range = 1 to 216 discrete display colors.

➢ **Brightness** – Range = 1 to 10, from dimmest to brightest.

➢ **Backlight** = On, Off or Auto (see **Auto Timeout** below).

➢ **Auto Timeout** – The amount of time that will elapse before the screen backlight turns off.
   Range = 1 to 300 seconds.

Sound

The Sound menu item allows the user to enable, or disable, sounds when a button is pushed or the control wheel is used.

To access the *Sound* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **Sound** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the value of each set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **System Configuration** screen.
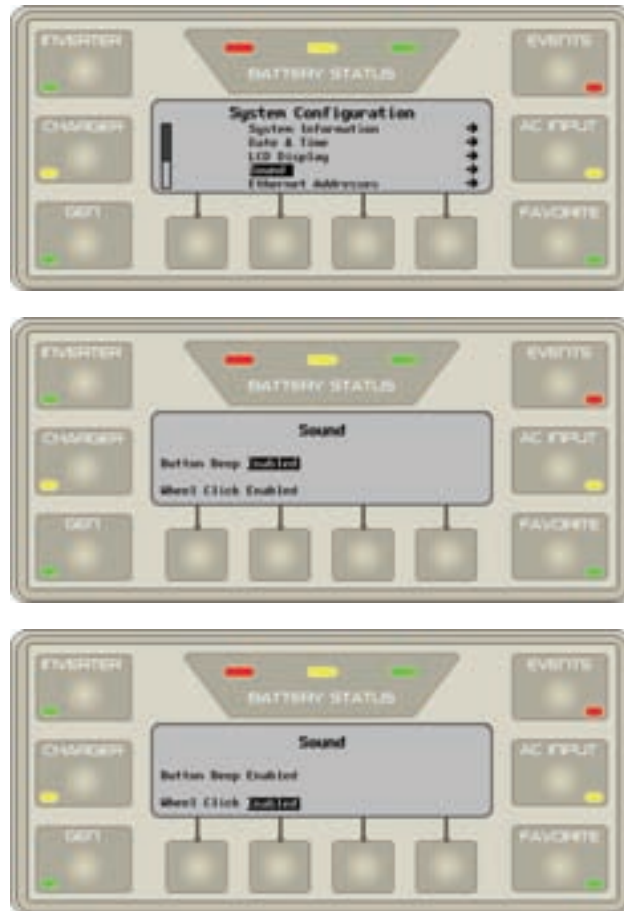
Figure 63   Sound

Set Points:

➢ **Button Beep** = Enabled or Disabled

➢ **Wheel Click** = Enabled or Disabled

Ethernet Addresses

This feature is not implemented at this time. To connect the MATE3 to a personal computer or network, it is necessary to to enable the Dynamic Host Configuration Protocol (DHCP).

To access the *Ethernet Addresses* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **Ethernet Addresses** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the value of each set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **System Configuration** screen.
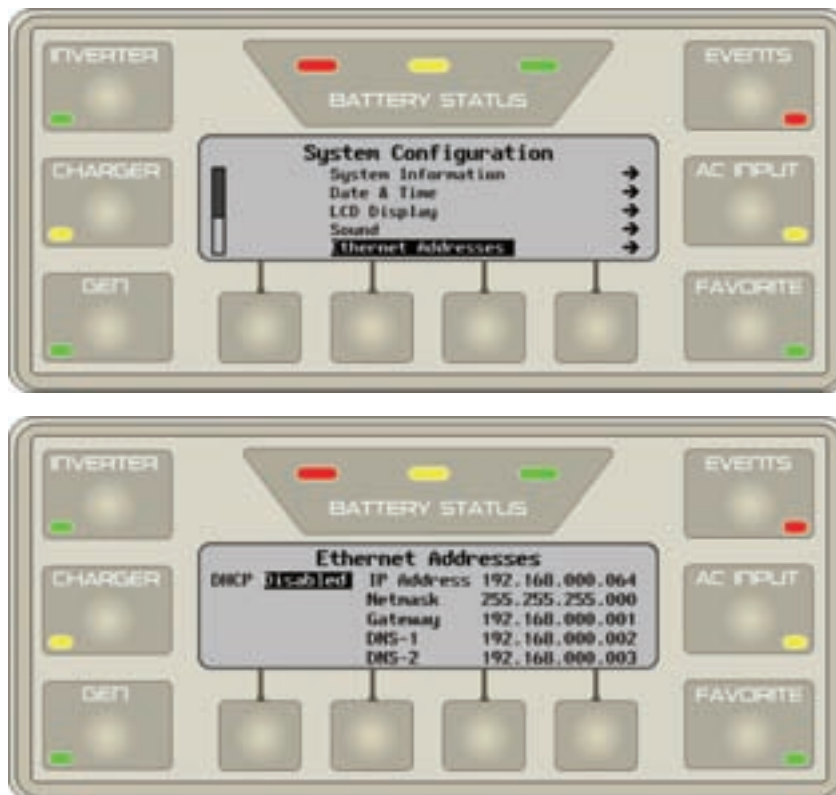
Figure 64   Ethernet Addresses

Set Points:

➢ **DHCP** = Enabled or Disabled
➢ **IP Address** = 192.168.000.xxx
➢ **Gateway =** 255.255.255.000
➢ **DNS-1**= 192.168.000.xxx
➢ **DNS-2**= 192.168.000.xxx

Ethernet Ports

This feature is not implemented at this time. Once DHCP is enabled and the ethernet addresses are set, it is necessary to establish which ports on the network are to be used by the MATE3.

To access the *Ethernet Ports* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **Ethernet Ports** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the value of each set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

4. After setting the parameters for each set point, press the **TOP** navigation key to return to the **System Configuration** screen.
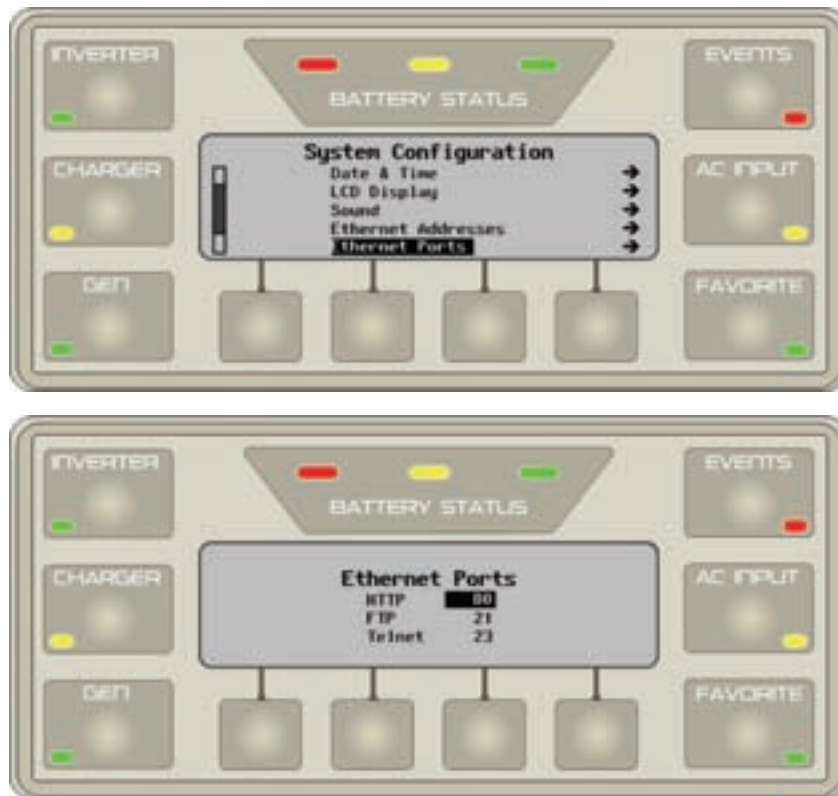
Figure 65   Ethernet Ports

Set Points:

➢ **HTTP** = Range TBD to TBD

➢ **FTP** = Range TBD to TBD

➢ **Telnet** = Range TBD to TBD

Data Stream

This feature is not implemented at this time. Once the communication connection is established, it is necessary to configure how the information is going to be sent to the personal computer or network.

➢ Use the Serial Data Stream option if the data's destination will be a personal computer.
➢ Use the Network Data Stream option if the data is destined for a network server.

To access the *Data Stream* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **Data Stream** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the value of each set point.
   Press the button in the center of the control wheel to accept the selection.
   The selection should automatically advance to the next set point when the button is pushed.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **System** menu items screen.

Figure 66   Data Stream Screen

Set points:

➢ Serial Data Stream (for connecting to a personal computer) = Enabled or Disabled

➢ Serial Baud Rate = TBD

➢ Network Data Stream (for connecting to a network server) = Enabled or Disabled
   (Not functional at this time)

➢ Destination IP = The IP address of the host computer or server.

➢ Destination Port = The port number assigned to the MATE3 on the host computer or server.

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Installer Settings

These features are not implemented at this time.

The ***Installer Settings*** menu provide the means to:

➢ set the user access level, preventing unauthorized access to certain levels of menus,
➢ change the installer password, or to
➢ challenge the installer password.

To access the *Installer Settings* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Use the control wheel to highlight the **Installer Settings** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to select the desired menu.
   Then press the button in the center of the control wheel to accept the selection.

4. To exit this screen, press the TOP navigation key to return to the ***Main Menu*** screen.
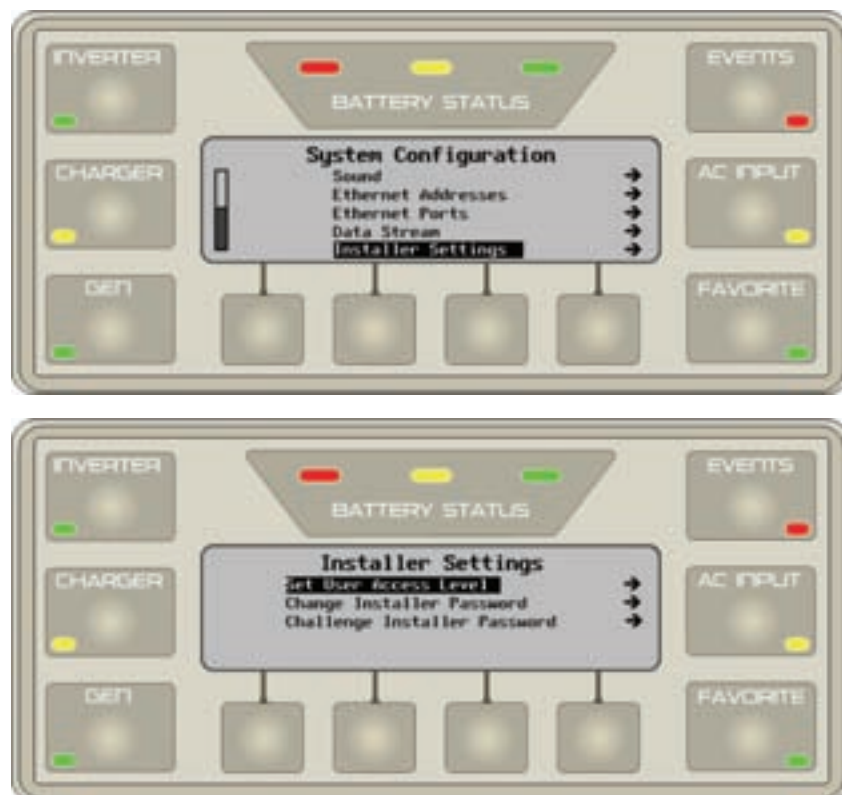
Figure 67   Installer Settings Screen

Set User Access Level

This feature is not implemented at this time.

The **Set User Access Level** menu allows four different levels of user access to set points for programming. A user who enters the standard password (**141)** will only have access to the menus permitted by this setting.

To access the *Set User Access Level* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Access the **Installer Settings** menu as shown in Figure 67.

3. Use the control wheel to highlight the **Set User Access Level** menu.
    Press the button in the center of the control wheel to accept the selection.

4. Use the control wheel to change the value of the set point to **Full**, **Advanced**, **Basic**, or **Minimum.**
    Press the button in the center of the control wheel to accept the selection.

5. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 68   Set User Access Level

Set Points:

➢ **Full** - (TBD)
➢ **Advanced** - (TBD)
➢ **Basic** – (TBD)
➢ **Minimum** – (TBD)

Change Installer Password

This feature is not implemented at this time.

The **Change Installer Password** screen allows changes to the Installer Password so that access to the full menus can be restricted to those who know the new password (OEMs or installers).

> **IMPORTANT:**
> Changes to system settings should only be made by qualified personnel or under the direction of OutBack Technical Support.

To access the *Change Installer Password* menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Access the **Change Installer Password** menu as shown in Figure 67.

3. Use the control wheel to adjust each of the four set points.
   Press the button in the center of the control wheel to accept the selection.

4. After setting the parameters for each set point, press the **TOP** navigation key to return to the **Main Menu** screen.
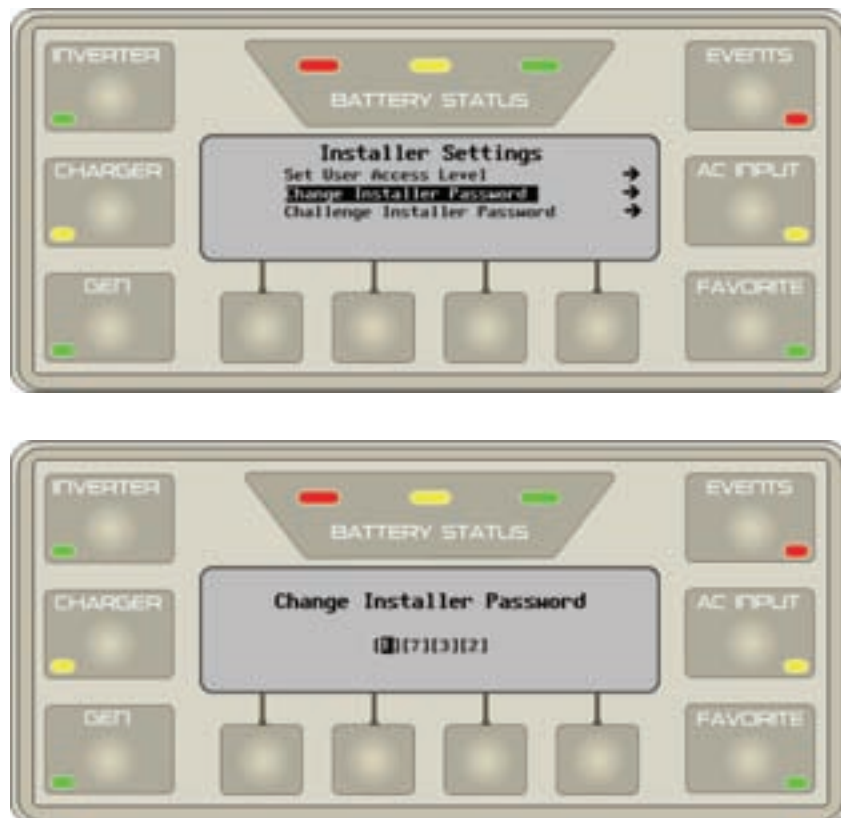
**Figure 69   Change Installer Password**

Set Points:

➢ Set points include four numerical digits from 0-9.

➢ The default Installer Password is **1732**.

Challenge Installer Password

This feature is not implemented at this time.

If the installer password is lost or forgotten, this process is used to reset access to the device. The screen will generate a challenge code as shown below. Once the installer has the challenge code, it is necessary to contact OutBack Technical Support (*see inside front cover*) to obtain a temporary installer password that corresponds with the MATE3-generated challenge code. After entering the temporary installer password, the installer should change the password according to their preferences.

To access the *Set User Access Level* Menu:

1. Access the **System Settings** menu as shown in Figure 59.

2. Access the **Change Installer Password** menu as shown in Figure 67.

3. Use the control wheel to adjust each of the four set points.
   Press the button in the center of the control wheel to accept the selection.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
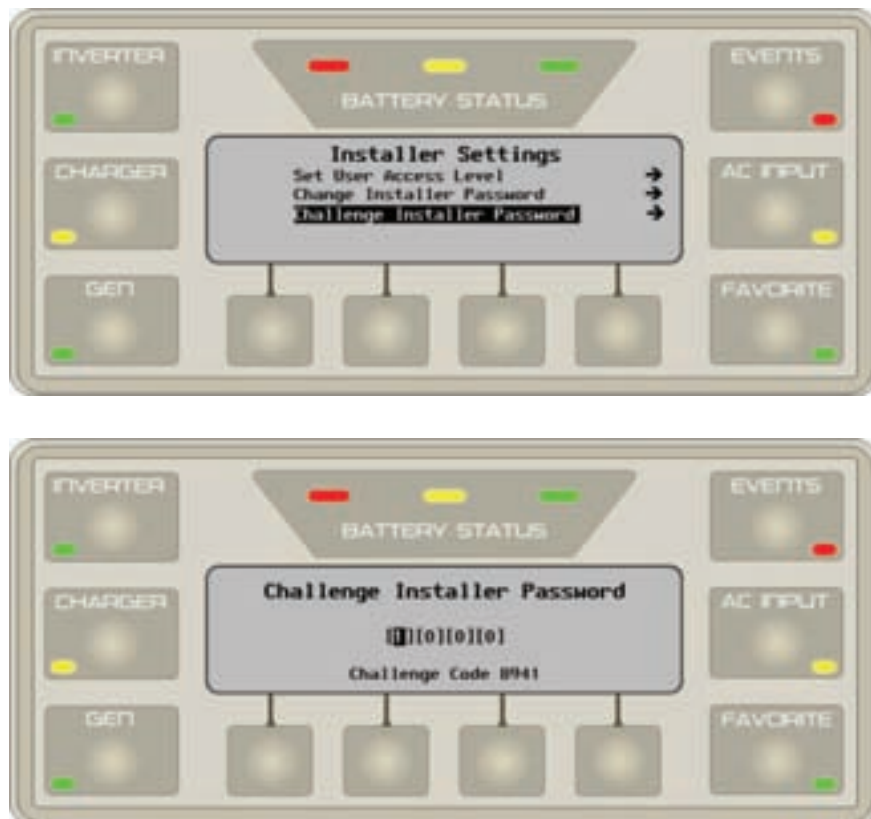

**Figure 70   Challenge Installer Password**

Set Points:

➢ Set points include four numerical digits from 0-9.

Inverter Settings

Inverter menu options include the following:
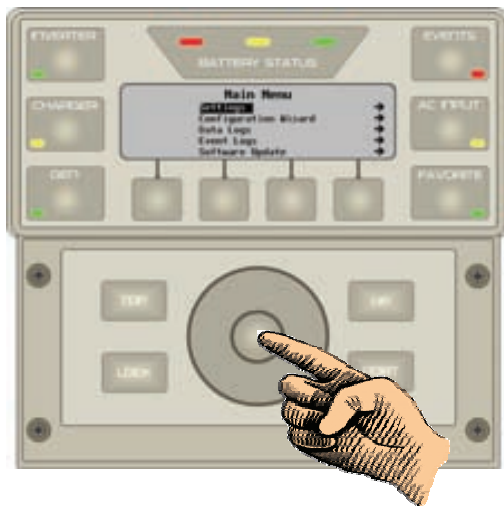
To access the *Inverter* menu:

1. Access the **Main Menu** as shown in Figure 56.

    ~ If **Settings** is highlighted in the **Main Menu**, then press the button in the center of the control wheel to accept the selection.

    ~ If **Settings** is not highlighted, then use the control wheel to scroll up or down until **Settings** is highlighted. Then press the button in the center of the control wheel to accept the selection.

2. Use the control wheel to scroll down until **Inverter** is highlighted.

3. Press the button in the center of the control wheel to accept the selection.
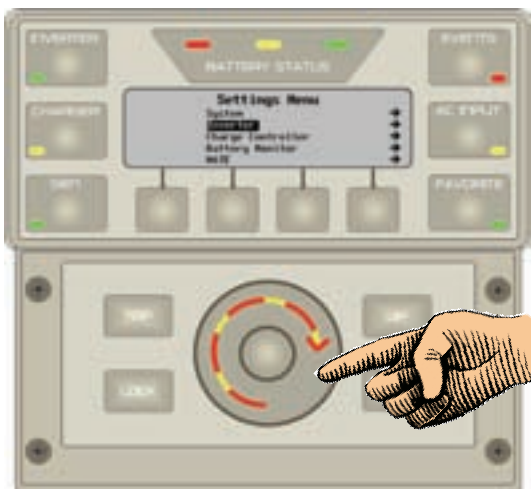
Figure 71   Setting the Inverter

Search Menu

This menu adjusts the inverter's search circuit, which minimizes power draw when no loads are present. See the inverter *Operator's Manual* for more information on the Search function.

To access the *Search* menu:

5. Access the **Inverter** menu as shown in Figure 71 on page 75.

6. Use the control wheel (if necessary) to highlight the **Search** menu.
    Press the button in the center of the control wheel to accept the selection.

7. Use the control wheel to adjust each set point.
    Press the button in the center of the control wheel to accept the selection.
    This should cause the highlighting to advance to the next set point.
    Repeat for each set point.

8. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
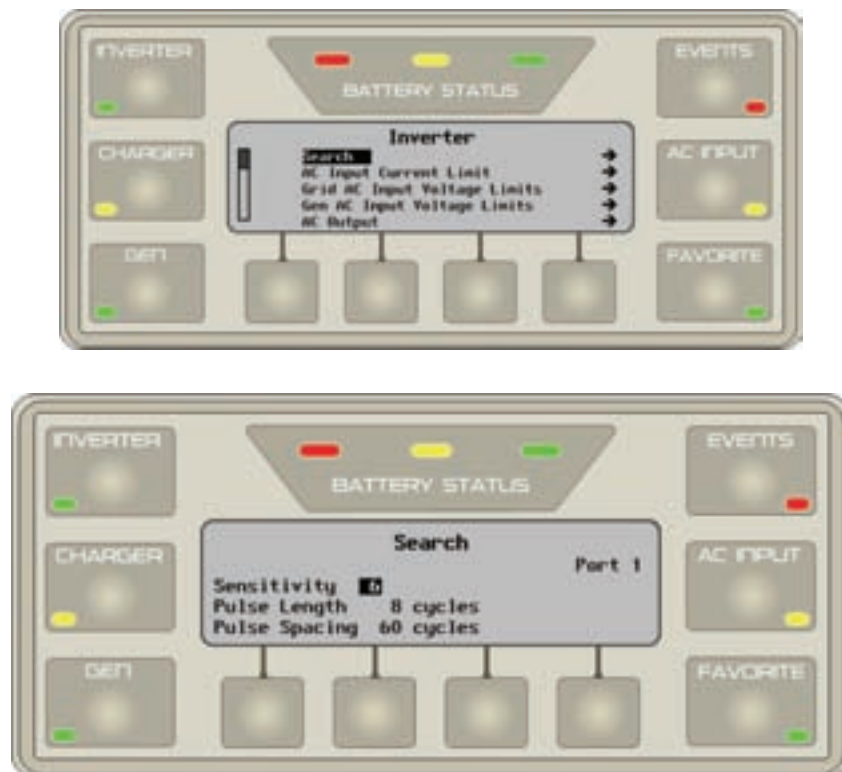
Figure 72   Search Screen

Set Points:

➢ **Sensitivity:** Adjusts the Search mode sensitivity while searching for loads. Setting this item to zero will disable Search.

➢ **Pulse length:** Adjusts the duration of each search pulse (in single AC cycles). A longer duration means inverter detects a load more quickly. It also consumes more power.

➢ **Pulse spacing:** Adjusts the time between search pulses (in single AC cycles). Shorter spacing means the inverter detects a load more quickly. It also consumes more power.

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AC Input Current Limit

This menu controls the amount of current that the inverter can draw from the source(s). The menu has independent settings for two different AC sources. In the most common applications, one source is the utility grid and the other is an AC generator. The settings are labeled accordingly.

These settings should be adjusted to match the size of the input circuit breaker or input conductor. This is intended to protect a generator or source that may not be large enough to supply enough current. If the combined charging and loads exceed this setting, the inverter will reduce its charge rate and give priority to the loads.

If the loads exceed this number on their own, the charge rate will be reduced to zero. This setting may be assisted by the Input Support function, if present in the inverter. (If present, see the inverter *Operator's Manual* for information about this function.)

If the loads still exceed this setting, the input breaker may trip. The unit will display an event with the following warning (see Figure 23 and Figure 47): **Input Amps > Max .**

This menu has an independent current setting for the inverter's battery charger.

If multiple parallel inverters are installed with an AC source of limited wattage, the total combined amperage settings for all units must be less than the AC input circuit. The inverters do not perform this calculation. It may be necessary to divide the input size by the number of inverters and assign an equal part of the amperage to each port. See the inverter *Operator's Manual* for more information on managing input current.

To access the *AC Input Current Limit* menu

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **AC Input Current Limit** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to adjust each set point.
   Press the button in the center of the control wheel to accept the selection.
   This should cause the highlighting to advance to the next set point.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

See Figure 73 on page 78 for set point descriptions.
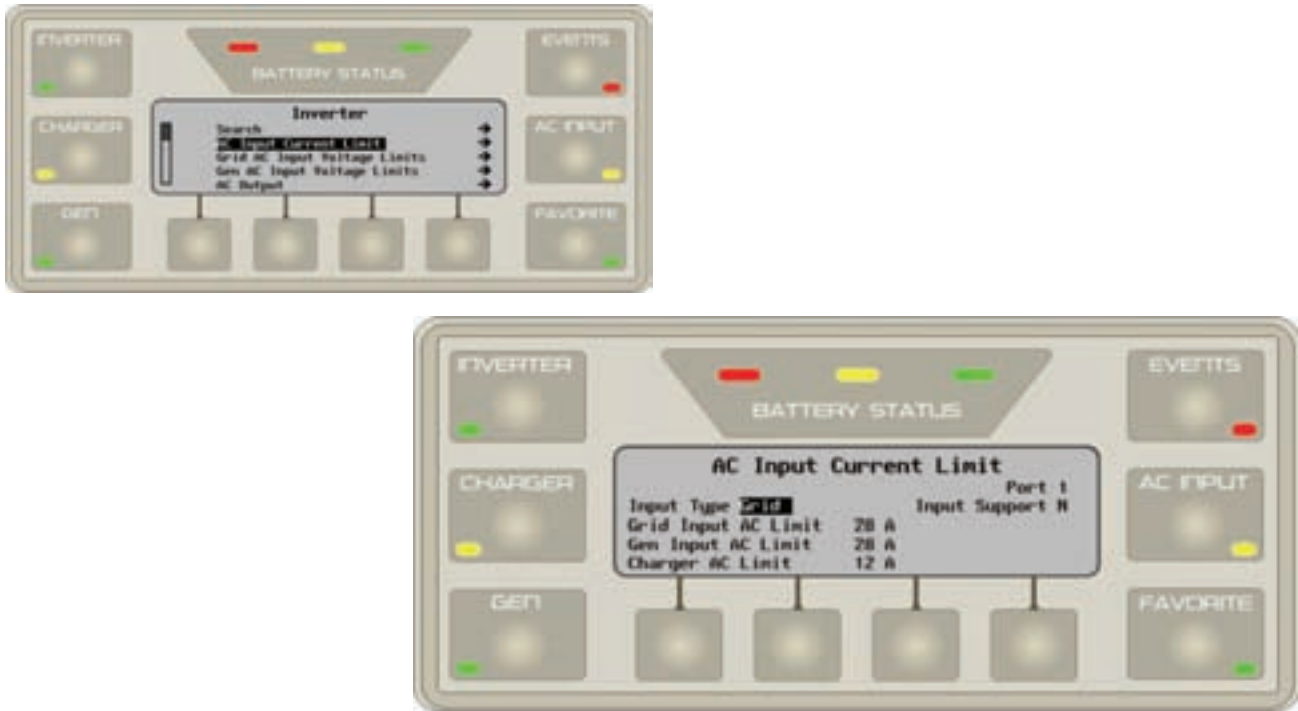
Figure 73   AC Input Current Limit

Set Points:

➢ *Input Type*: The inverter has two choices for incoming power; *Grid* or *Gen*. It is not capable of using both at the same time. However, it can select between two different sources, typically the utility grid and an AC generator, if properly switched. Each choice has parameters that define the usage of each input. If *Input Type* is selected to *Grid*, the inverter uses the utility grid settings. (See page 79.) If the menu is set to *Gen*, the inverter uses the generator settings. (See page 80.)

Note: In OutBack grid-interactive inverters, *Input Type* also controls the cycle used by the inverter's battery charger. This overrides the selections offered in the *Charger Status* screen. (See page 51.)

~   *Grid* selects a charge cycle consisting of bulk , absorption and float stages. Upon completion, the charger goes into silent mode until it reaches the "re-float" voltage, when it will re-enter the float stage.

~   *Gen* selects a charge cycle consisting of bulk , absorption and float stages. Upon completion, the charger remains in the float stage to maintain the batteries until the AC input is disconnected.

The selection of the charge cycle does not automatically enable the charger. If the charger is disabled, it must still be enabled using the the *Charger Status* screen. (See page 51.)

~   The *Input Type* selection also controls other AC source parameters, as described in the inverter *Operator's Manual*. Note that if *Gen* is selected, a grid-interactive inverter will not sell power. However, the AGS function (see page 114) will function even if *Grid* is selected.

➢ *Grid Input AC Limit:* Adjusts the inverter's draw to the size of the utility grid circuit.

➢ *Gen Input AC Limit:* Adjusts the inverter's draw to the size of the AC generator or generator circuit.

➢ *Charger AC Limit:* Adjusts the draw of the inverter's charger.   The maximum setting is equal to the maximum delivery of the inverter's charger. This setting can be limited to avoid accidentally overcharging a small battery bank.

➢ *Input Support*: Enables the Input Support function, if present in the inverter. (If present, see the inverter *Operator's Manual* for information about this function.)

Grid AC Input Voltage Limits

The inverter will not connect to an AC source unless specific conditions are met. When *Input Type* is set to *Grid* in the *AC Input Current Limit* screen (Figure 73 on page 78), this menu adjusts the limits on acceptable voltage for the utility grid. (Frequency is not adjustable.) These limits will vary with the inverter model. See the *Operator's Manual* for specific acceptance limits.

When the conditions are met, the inverter will accept the grid after a delay of approximately 15 seconds.

To access the *Grid AC Input Voltage Limits* menu:

1. Access the *Inverter* menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the *Grid AC Input Voltage Limits* menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to adjust each set point.
    Press the button in the center of the control wheel to accept the selection.
    This should cause the highlighting to advance to the next set point.
    Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the *Main Menu* screen.
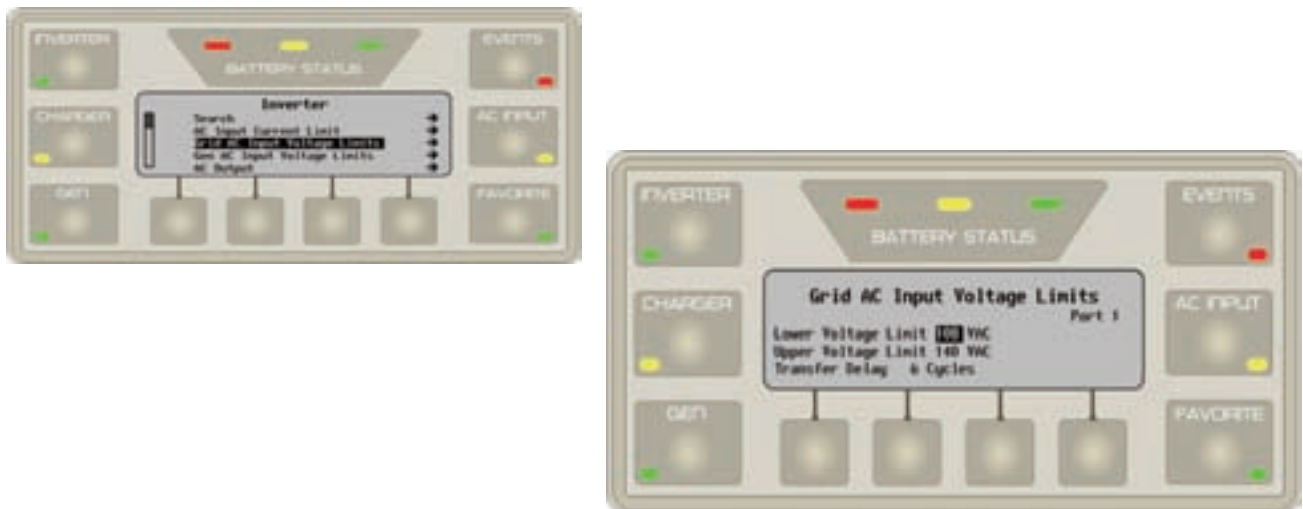
Figure 74   Grid AC Input Voltage Limits

Set Points:

➢ *Lower Voltage Limit:* Sets the low limit on the acceptable AC voltage. If the source is above this voltage, the inverter will accept it. If it drops below this voltage, the inverter will return to inverting, if enabled.

➢ *Upper Voltage Limit:* Sets the high limit on the acceptable AC voltage. If the source is below this voltage, the inverter will accept it. If it rises above this voltage, the inverter will return to inverting, if enabled.

➢ *Transfer Delay:* Sets the duration that the input AC voltage or frequency may exceed limits before the inverter disconnects itself. This may be preceded by a warning (see page 39), and may be followed by a *Last AC Disconnect* message (see page 54.)

Gen AC Input Voltage Limits

The inverter will not connect to an AC source unless specific conditions are met. When **Input Type** is set to **Gen** in the **AC Input Current Limit** screen Figure 73 on page 78), this menu adjusts the limits on acceptable voltage for a generator. (Frequency is not adjustable.) These limits will vary with the inverter model. Check the *Operator's Manual* for specific acceptance limits.

When the conditions list in this screen are met, the inverter will accept the generator after the designated delay period (see below).

To access the *Gen AC Input Voltage Limits* menu:

5.   Access the **Inverter** menu as shown in Figure 71 on page 75.

6.   Use the control wheel to highlight the **Gen AC Input Voltage Limits** menu.
     Press the button in the center of the control wheel to accept the selection.

7.   Use the control wheel to adjust the set point to the correct value.
     Press the button in the center of the control wheel to accept the selection.

8.   Press the **TOP** navigation key to return to the **Main Menu** screen.

Figure 75   Gen AC Input Voltage Limit

Set Points:

➤ **Lower Voltage Limit:** Sets the low limit on the acceptable AC voltage. If the source is above this voltage, the inverter will accept it. If it drops below this voltage, the inverter will return to inverting, if enabled.

➤ **Upper Voltage Limit:** Sets the high limit on the acceptable AC voltage. If the source is below this voltage, the inverter will accept it. If it rises above this voltage, the inverter will return to inverting, if enabled.

➤ **Transfer Delay:** Sets the duration that the input AC voltage or frequency may exceed limits before the inverter disconnects itself. This may be preceded by a warning (see page 39), and may be followed by a **Last AC Disconnect** message (see page 54.)

➤ **Connect Delay:** Sets the designated delay period before the inverter begins accepting power from the generator. This is intended to give the generator time to stabilize its output. It is not the same as the warmup period used by the AGS function (see page 115.)

AC Output

This menu adjusts the output voltage produced while the inverter is inverting (running on battery power). This setting does not affect the output when using another AC input source. It does not affect the acceptance parameters for an AC input source. (See pages 79 and 80.) The range of adjustability will vary with inverter model. See the inverter *Operator's Manual* for the specific range of adjustability.

To access the *Output Voltage* menu:

1. Use the control wheel to highlight the **AC Output** menu.
    Press the button in the center of the control wheel to accept the selection.

2. Use the control wheel to increase or decrease the set point to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.

3. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
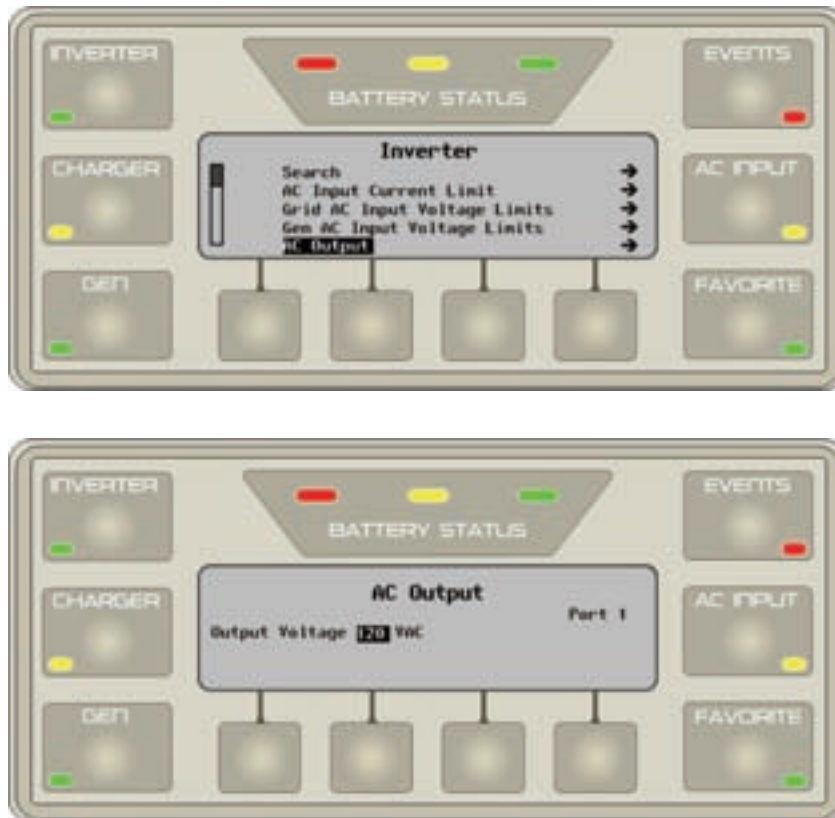
Figure 76   AC Output

Set Points:

➢ **Output Voltage:** Adjusts the inverter's output voltage while in inverting mode.

Low Battery

While inverting, the inverter will not be able to sustain its operation if the battery voltage goes below a certain point. The inverter will stop functioning and generate an error. The EVENTS LED will illuminate to indicate an event has occurred. (See Figure 134 on page 139 for reviewing event details.)

This function, Low Battery Cut-Out, is often referred to as LBCO. The function is intended to protect the the batteries, as excessive discharge may damage a battery. It also protects the inverter's output and loads. Continuing to invert on a low DC voltage may produce a distorted waveform.

The range of adjustability will vary with inverter model. See the inverter *Operator's Manual* for the specific range of adjustability.

The inverter will also stop functioning and give an error due to high battery voltage. However, the high-battery cut-out voltage is not adjustable.

To access the *Low Battery* menu:

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **Low Battery** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.
    Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 77   Low Battery

Set Points:

➢ **Cut-Out Voltage:** Sets the voltage at which the inverter shuts off due to a low-battery condition. If the batteries drop to this voltage for five consecutive minutes, the inverter will stop functioning. The inverter's ERROR LED will illuminate. The MATE3 will display an event, with a **Low Battery V** error appearing in the **Inverter Errors** menu.

➢ **Cut-In Voltage:** Sets the voltage at which the inverter recovers from LBCO. If the batteries rise to this voltage for ten consecutive minutes (usually through charging), the inverter will begin functioning again. The **Low Battery V** error will clear itself.

Battery Charger

IMPORTANT:

Battery charger settings need to be correct for a given battery type. Always follow battery manufacturer recommendations. Making incorrect settings, or leaving them at factory default settings, may cause the batteries to be undercharged or overcharged.

The inverter uses a "three-stage" battery charging cycle which utilizes multiple settings. This menu controls the voltages and timers for the battery charger. See the inverter *Operator's Manual* for an explanation of the three-stage cycle and a description of the individual stages.

In a grid-interactive model, the Sell voltage setting is used as part of the charging cycle. That voltage is not accessible here, but is settable in the **Grid-Tie Sell** menu (see page 90). The Equalize settings are also not accessible here, but are settable in the **Battery Equalize** menu (see page 84).

To access the Battery Charger menu:

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **Battery Charger** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
   Press the button in the center of the control wheel to accept the selection.
   This should automatically move the highlighting to the next set point.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.


Figure 78   Battery Charger

Set Points:

- ➢ **Absorb Voltage:**   Adjusts the target voltage of Bulk and Absorption stages.
- ➢ (Absorb) **Time:**   Adjusts the duration of the Absorption stage.
- ➢ **Float Voltage:**   Adjusts the target voltage of the Float stage.
- ➢ (Float) **Time:**   Adjusts the duration of the Float stage, once the voltage has been reached.
- ➢ **Re-Float Voltage:**   Adjusts the point at which the Float stage begins again.

Battery Equalize

⚡	**WARNING: Explosion Hazard** Improper equalization of batteries can cause them to burst and can ignite hydrogen sulfide, an explosive gas. Contact your battery manufacturer for recommendations on equalization voltage, duration, schedule, and advisability. Do not equalize any battery unless approved by the manufacturer.
⚠	**CAUTION: Battery Damage** Do not equalize sealed gel batteries; this will destroy them. Do not equalize any other battery types unless approved by the manufacturer.

This menu controls the settings for the equalization process, which is used for battery maintenance. See the inverter *Operator's Manual* for an explanation of equalization and how it relates to the regular charging process.

To access the *Battery Equalize* **menu:**

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **Battery Equalize** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
   Press the button in the center of the control wheel to accept the selection.
   This should automatically move the highlighting to the next set point.
   Repeat for each set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.


Figure 79   Battery Equalize

Set Points:

➢ **Equalize Voltage:** Adjusts the voltage of the Equalization cycle.
➢ (Equalize) **Time:** Adjusts the duration of the Equalization cycle, once the voltage has been reached.

Auxiliary Output

This menu controls the output and functionality of the Auxiliary (AUX) output. The inverter's Auxiliary (AUX) terminals provide a 12 Vdc output that can deliver up to 0.7 Adc to control external loads. Typical loads include signaling a generator to start, sending a fault alarm signal, or running a small fan to cool the inverter. See the inverter *Installation Manual* for more information on hooking up the AUX terminals. This menu controls the output and functionality of the Auxiliary (AUX) output.

To access the *Auxiliary Output* menu:

1. Use the control wheel to highlight the **Auxiliary Output** menu.
    Press the button in the center of the control wheel to accept the selection.

2. Use the control wheel to change the AUX mode to the desired setting.
    Press the button in the center of the control wheel to accept the selection.

3. Press either the <**Off**>, <**Auto**>, or <**On**> soft keys to change the status of the function.

4. After setting the parameters for each set point, press the TOP navigation key to return to the
    Main Menu screen.

Figure 80   Auxiliary Output

Set Points:
➢ **Status**: The Auxiliary output status is controlled from by the <**Off**>,<**Auto**>, and <**On**> soft keys.

~   <**On**> activates the AUX output immediately. It will remain continuously active until Off is selected. If this soft key is pressed, the screen will display **Manual On**.

~   <**Auto**> sets the AUX to be triggered by automatic criteria, according to the option selected in Aux Mode. If this soft key is pressed, the screen will display **Auto On** or **Auto Off**.

~   <**Off**> disables the Auxiliary output and prevents any of the inverter's automatic AUX options from working. Note that even if the AUX output is set to Off, it may still be triggered by an external option not based in the inverter, such as AGS. (See page 114.) If this soft key is pressed, the screen will display **Manual Off**.

➢ **Aux Mode:** Selects one of nine options with automatic criteria. The options appear in the following order when the wheel is drawn clockwise. (The options are described in greater detail in the inverter *Operator's Manual*.) **Remote**, **Fault**, **Cool Fan**, and **AC Drop** have no adjustable settings.   In Figure 80, **Cool Fan** is shown as an example of an option that has no adjustments.

~   **Remote** allows the AUX output to be enabled in response to manual or automatic commands based in the MATE3 (such as AGS). Although the MATE3 can control the AUX output even when one of the other options is enabled, **Remote** keeps the inverter from interfering with the MATE3.

~ ***Load Shed*** performs load management. The Auxiliary output activates when DC (battery) voltage drops below a certain level. The AUX output controls a larger relay, which turns non-critical loads on or off to conserve battery power.

   ➡ This option has a settable DC voltage parameter.

Set Points for *Load Shed*:

  ➤ ***Enable Voltage:*** Sets the low-voltage level at which the Load Shed function turns on the AUX output.   It remains on for three minutes.

<div align="center">

Figure 81   Load Shed

</div>

~ ***Gen Alert*** is used as a controller with (with limited functionality) for an AC generator with a remote start feature. It can start and stop the generator based on DC (battery) voltage levels.

   ➡ This option has settable DC voltage and time parameters.

Note: This option does not have the same advantages as the Advanced Generator Start (AGS) function which is controlled directly by the MATE3. (See page 114.)

Set Points for *Gen Alert:*

  ➤ ***ON Voltage:*** Sets the low-voltage level at which the ***Gen Alert*** function turns on the AUX output.

  ➤ ***ON Delay:*** Sets the delay time after the ***ON Voltage*** setting is reached before the AUX output is turned on.

  ➤ ***OFF Voltage:*** Sets the high-voltage level at which the ***Gen Alert*** function turns off the AUX output.

  ➤ ***OFF Delay:*** Sets the delay time after the ***OFF Voltage*** setting is reached before the AUX output is turned off.

<div align="center">

Figure 82   Gen Alert

</div>

~ ***Fault*** enables the AUX output when the inverter shuts down due to an error condition (see page 40). It can activate a light or alarm to show that the inverter has failed.

~ ***Vent Fan*** enables the AUX output in response to high DC (battery) voltage. It can run a small fan to ventilate the battery compartment to eliminate gases that result from battery charging.

   ➡ This option has settable DC voltage and time parameters.

Set Points for *Vent Fan:*

  ➤ ***Enable Voltage:*** Sets the high-voltage level at which the function turns on the AUX output. It remains on for one minute.

  ➤ ***OFF Delay:*** Sets the delay time before the function turns the AUX output on again.

<div align="center">

Figure 83   Vent Fan

</div>

~ **Cool Fan** enables the AUX output when the inverter reaches a high internal temperature. It is intended to trigger a small external fan for additional cooling. This includes sealed inverter models which come with a Turbo fan.

~ **Divert DC** enables the AUX output to divert excess energy to a DC load, in response to high DC (battery) voltage. The Auxiliary output controls a larger relay, which allows current to flow to a dedicated DC load when energized.

➡ This option has settable DC voltage and time parameters.

Set Points for *Divert DC:*

➢ **Enable Voltage:** Sets the high-voltage level at which the Divert DC function turns on the AUX output. It remains on as long as the voltage remains above this set point.

➢ **OFF Delay:** Prevents the AUX output from turning on again for a certain amount of time, even if the voltage rises above the Enable Voltage set point again. This prevents nuisance cycling of the **Divert DC** function.

Figure 84   Divert DC

~ **Divert AC** enables the AUX output to divert excess energy from the inverter's output to an AC load, in response to high DC (battery) voltage. The Auxiliary output controls a larger relay, which allows current to flow to a dedicated AC load when energized.

➡ This option has settable DC voltage and time parameters.

Set Points for *Divert AC:*

➢ **Enable Voltage:** Sets the high-voltage level at which the Divert AC function turns on the AUX output. It remains on as long as the voltage remains above this set point.

➢ **OFF Delay:** Prevents the AUX output from turning on again for a certain amount of time, even if the voltage rises above the Enable Voltage set point again. This prevents nuisance cycling of the **Divert AC** function.

Figure 85   Divert AC

~ **AC Drop** enables the AUX output whenever the inverter disconnects from an AC source. It can activate a light (or alarm) to show that the utility grid has failed or that a generator has shut off.

Inverter Stacking

IMPORTANT:
All inverters connected to ports on the HUB must be assigned valid designations for stacking and Power Save Levels. If this is not done, the system may give any number of Error messages or other symptoms.

This menu contains settings to coordinate, or "stack", multiple inverters in a combined system. It also has settings for Power Save Levels, which allow unused inverters to go into Silent mode to save power.

Stacking assigns an inverter to a particular phase or "leg". Any inverter connected to an OutBack HUB must be designated as master or slave of some type.

The available stacking configurations and menu options will vary with inverter model.   Stacking configurations, options, and other details are discussed in both the *Installation Manual* and the *Operator's Manual* for the inverter.

To access the *Inverter Stacking* menu:

1.   Access the **Inverter** menu as shown in Figure 71 on page 75.

2.   Use the control wheel to highlight the **Inverter Stacking** menu.
     Press the button in the center of the control wheel to accept the selection.

3.   Use the control wheel to change the **Stack Mode** to the desired setting.
     Press the button in the center of the control wheel to accept the selection.
     This should automatically advance the highlighting to the **Master Power Save Level** set point.

4.   Use the control wheel to adjust the **Master Power Save Level** set point.
     Press the button in the center of the control wheel to accept the selection.
     This should automatically advance the highlighting to the **Slave Power Save Level** set point.

IMPORTANT:
Inverters with higher-level settings will go into Silent mode sooner. The master must stay on and should have the lowest setting. The default is zero (0). Normally it should be left at zero (0).

5.   Use the control wheel to adjust the **Slave Power Save Level** set point.
     Press the button in the center of the control wheel to accept the selection.

6.   After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

IMPORTANT:
➢   Stack Modes are inverter-dependent. The Stack Modes listed show all possible Stack Modes, some of which may not be available with all OutBack inverters.
➢   The inverter's *Installation Manual* describes the available stacking configurations for each inverter and the modes required for each.
➢   Do not select Stack Modes other than those identified for the specific inverter model being used.

Figure 86   Inverter Stacking

Set Points:

➤ **Stack Mode:** Assigns the inverter to a specific priority and phase (leg). This assignment must be made for every inverter that is connected to a HUB port. In a multiple-inverter system, one inverter must be assigned as master. The others are assigned to other phases or as slaves.

   ~ **Master** or **1-2ph Master:**   The primary inverter for single –unit systems, single-phase systems, or split-phase systems. In models where this selection reads Master, it is also used for three-phase systems.

   ~ **Classic Slave:** A secondary unit, partly independent of the master. This slave is L2 (phase 2), with output 180° out of phase from the master.

   ~ **OB Slave L1:** A secondary unit for single-phase (parallel) or split-phase multiple-inverter systems. An L1 slave is in the same phase as the master.

   ~ **OB Slave L2:** A secondary unit for split-phase multiple-inverter systems. This slave is L2 (phase 2), which is 180° out of phase from the master.

   ~ **3p Master or 3ph Master:**   The primary inverter for three-phase systems that include the selection 1-2ph Master as shown above. The 3p Master is Phase A.

   ~ **3ph Classic B or C;** also, **3p OB Slave A**, **B**, or **C**: A secondary unit for three-phase systems. Its output is 120° out of phase with other phases. Used in newer models where the phases are manually assigned.

   ~ **3ph Slave:** A secondary unit for three-phase systems. Its output is 120° out of phase with other phases. Used in older models where the phases are assigned based on the inverter's position in the HUB.

➤ **Master Power Save Level:** Sets the inverter priority so that unused slaves go into Silent mode. This setting is only used with the master (the unit on P01). It is visible on other ports, but should not be used on ports other than P01.

➤ **Slave Power Save Level:** Sets the inverter priority so that unused slaves go into Silent mode. This setting is only used with slave units (units on ports other than P01). It is visible for the master, but should not be used on P01.

Grid-Tie Sell

The following descriptions apply to grid-interactive inverter models only. In other models, these menus are inoperative.

> **IMPORTANT: On grid-interactive models only:**
> The grid-interactive function can sell power using the input connection. This function only operates if **Grid** is selected in the **AC Transfer Control** menu. It does not function if **Gen** is selected.

This menu controls the limits of the inverter's "grid-tie" or grid-interactive function. See the inverter *Operator's Manual* for an explanation of the grid-interactive function and how it relates to the regular charging process.

To access the *Grid-Tie Sell* menu:

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **Grid-tie Sell** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the **Grid-Tie Enable** to **Y** (Yes) or **N** (No).
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. Use the control wheel to change the **Sell Voltage** set point.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

5. Use the control wheel to change the **Grid-Tie Window** set point to **User** or **IEEE**.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

6. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 87   Grid-Tie Sell

Set Points:

➢ **Grid-Tie Enable:** Enables or disables the inverter's grid-interactive function. If **Y** is selected, the function is turned on. If **N** is selected, the function is turned off.

➢ **Sell Voltage:** Sets the operating point for the grid-interactive function. When a renewable source raises the batteries above this point, the inverter exports power in order to bring the voltage back down. (The inverter cannot import AC power to raise the batteries to this level.) This means the Sell feature only functions when excess DC power is available. (However, if the charger is operating, it can also sell power using other charger set points. See the inverter *Operator's Manual* for more details.)

➢ **Grid-Tie Window:** Sets the requirements that the utility grid must meet for the grid-interactive function to work. If the voltage and frequency are within the ranges specified in each selection, the inverter can sell power. Otherwise, the selling function will not operate. The unit will display a message in the **Sell Status** menu (see page 46). Two selections are available, **IEEE** and **User**. Specific settings for each setpoint are listed in the inverter *Operator's Manual*.

   ~ The **IEEE** selection has narrower settings than the **User** setting.

   ~ **IEEE** is required by most utilities in the United States. (For American models, its voltage and frequency criteria are preset to the requirements of UL1741 and IEEE 1547.)

Calibrate

The **Calibrate** menu allows adjustment of the inverter's internal voltmeters. If a particular inverter's readings do not match those of another inverter or a handheld meter, the calibration feature may be used to improve consistency.

To access the *Calibrate* menu:

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **Calibrate** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to change the **Input Voltage** set point.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. Use the control wheel to change the **Output Voltage** set point.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

5. Use the control wheel to change the **Battery Voltage** set point.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

6. After setting the parameters for each set point, press the **TOP** navigation key to return to the
    Main Menu screen.

Set Points:

➢ **Input Voltage:** Calibrates the AC voltage measurement made at the inverter's AC input (from an incoming AC source).

➢ **Output Voltage:** Calibrates the AC voltage measurement made at the inverter's AC output (from the inverter's own power, or from an incoming AC source).

➢ **Battery Voltage:** Calibrates the DC voltage measurement made at the inverter's DC terminals.

Figure 88   Calibrate Screen

Figure 88 shows the current readings being taken by the inverter in Vac and Vdc. However, the field to the right of each value is the calibration setting. The settable range will vary with inverter model. See the inverter *Operator's Manual* for specific ranges.

Note: Calibration does not change the actual output of the inverter, only the reading of that output.

Also, measurements in places other than the inverter's terminals may differ regardless of calibration. For example, it is possible to get a different reading at the inverter's DC terminals than on the batteries. Connection problems, corrosion, and the effects of induction and resistance may all result in voltage differences. If this occurs, note that this is an issue with the system, not the inverter. Calibration cannot correct for it.

Reset to Factory Defaults

This menu allows the user to erase all settings from the selected inverter and start over with the values programmed at the factory. These values are listed in the inverter *Operator's Manual*.

To access the *Reset to Factory Defaults* **menu:**

1. Access the **Inverter** menu as shown in Figure 71 on page 75.

2. Use the control wheel to highlight the **Reset to Factory Defaults** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the soft keys below the LCD to select **No** or **Yes**.

    ~   If <**No**> is selected, the screen returns to the **Inverter** menu.
        No changes will be made to any settings.

    ~   If <**Yes**> is selected, the inverter's settings will immediately change to the original factory values.
        The screen will display the message **Inverter Restored to Factory Defaults.**   A <**Continue**> soft
        key will appear. Pressing this key will return the screen to the **Inverter** Menu.

4. After setting the parameters for each set point, press the TOP navigation key to return to the
    Main Menu screen.
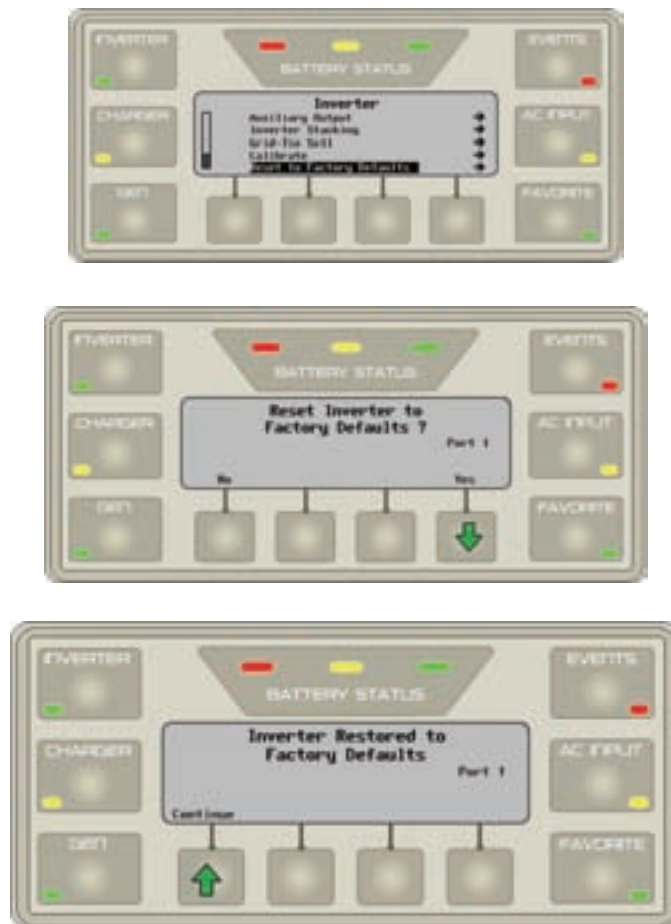
Figure 89   Resetting Factory Default Settings on the Inverter

Charge Controller Settings

Charge Controller menu options include the following:

To access the *Charge Controller* menu:

1. Access the **Main Menu** as shown in Figure 56.

    ~ If **Settings** is highlighted in the **Main Menu**, then press the button in the center of the control wheel to accept the selection.

    ~ If **Settings** is not highlighted, then use the control wheel to scroll up or down until **Settings** is highlighted. Then press the button in the center of the control wheel to accept the selection.

2. Use the control wheel to scroll down until **Charge Controller** is highlighted.

3. Press the button in the center of the control wheel to accept the selection.

Figure 90   Accessing the Charge Controller Menu

Charger

> **IMPORTANT:**
>
> Battery charger settings need to be correct for a given battery type. Always follow battery manufacturer recommendations. Making incorrect settings, or leaving them at factory default settings, may cause the batteries to be undercharged or overcharged.

The charge controller uses a "three-stage" battery charging cycle which utilizes multiple settings. This menu controls the voltages and timers for the battery charger. See the charger controller *User's Manual* for an explanation of the three-stage cycle and a description of the individual stages.

To access the *Charger* **menu:**

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Charger** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the
    Main Menu screen.

Figure 91   Charger

Set Points:

➢ **Absorb Voltage:** Adjusts the target voltage of Bulk and Absorption stages.

➢ **(Absorb)Time:** Adjusts the duration of the Absorption stage.

➢ **Float Voltage:** Adjusts the target voltage of the Float stage.

➢ **Rebulk Voltage:** Adjusts the point of low battery voltage that triggers a new Bulk stage after 90 seconds.

➢ **Current Limit:** Adjusts the maximum amperage of the battery charger.

➢ **Absorb End Amps:** Adjusts the level of "trickle" charge that will override the Absorb Time setting and switch the controller to the Float stage.

MPPT

The charge controller uses a maximum power point tracking (MPPT) algorithm which manipulates the output of the PV array to harvest maximum wattage. Although this function is automatic, this menu allows the user to adjust many of its parameters for special applications. See the charge controller *User's Manual* for more details on these parameters and their applications.

To access the *MPPT* menu:

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **MPPT** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

**Figure 92   MPPT**

Set Points:

➢   **MPPT Mode:** Selects between **Auto**, which allows automatic MPPT, and **U-Pick**, which limits the MPP tracking to a specified voltage.

➢   **U-Pick VOC:** Adjusts the MPP tracking limit, as a percentage of the array's open-circuit voltage (V_{OC}).

➢   **Wakeup VOC Change VDC:** The controller monitors the array V_{OC} for a voltage increase sufficient for the controller to leave Snooze mode and begin MPP tracking. This setting adjusts the amount of voltage increase for wakeup. (The *User's Manual* refers to this under the title "Wakeup Mode.")

➢   **Wakeup VOC Change Time:** The controller monitors the array V_{OC} and amperage to see if they are maintained long enough for the controller to leave Snooze mode and begin MPP tracking. (The voltage level must be at least 0.3 Vdc above battery voltage; the current level is controlled by the **Snooze Mode Amps** set point.) This setting adjusts the minimum time for wakeup. (The User's Manual refers to this under the title "Wakeup Mode.")

➢   **Snooze Mode Amps:** Adjusts the required current level detected by the controller during the wakeup time (see previous item).

➢   **MPPT Range Minimum:** Adjusts the lower end of the controller's tracking algorithm. This can narrow the focus of the initial MPPT process. The options are half the array's V_{OC}, or the full V_{OC}. (The *User's Manual* refers to this under the title "Mpp Range Limit %.")

➢   **MPPT Range Maximum:** Adjusts the upper end of the controller's MPP tracking algorithm. The options are 80%, 85%, 90%, and 99% of the array's V_{OC}. (The *User's Manual* refers to this under the title "Mpp Range Limit %.")

Temperature Compensation

When equipped with the Remote Temperature Sensor (RTS), the charge controller compensates for temperature changes by raising or lowering its charging voltages. However, in some cases the sensitivity of other DC devices may require this temperature compensation to be limited. This menu allows the user to manually adjust the upper and lower limits of temperature compensation. See the charger controller *User's Manual* for an explanation of temperature compensation and more information on manual limits.

To access the *Temperature Compensation* **menu:**

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Temperature Compensation** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 93   Temperature Compensation

Set Points:

➢ *Mode:* Selects between **Wide**, which allows full compensation, and **Limited**, which allows the manual limits controlled by the next two set points. (The charge controller *User's Manual* features this as an option under "RTS Compensation."

➢ *Limited: Lower Battery Voltage:* Adjusts the lowest allowed compensated voltage. (The *User's Manual* features this as an option under "RTS Compensation.")

➢ *Limited: Upper Battery Voltage:* Adjusts the highest allowed compensated voltage. (The *User's Manual* features this as an option under "RTS Compensation.")

Note: If the **Mode** set point is selected to **Wide**, the temperature compensation will be controlled only by the RTS. The **Lower** and **Upper** settings can be changed, but they will have no effect. In either mode, the RTS must be present for *any* compensation to take effect.

Battery Equalize

⚡	**WARNING: Explosion Hazard** Improper equalization of batteries can cause them to burst and can ignite hydrogen sulfide, an explosive gas. Contact your battery manufacturer for recommendations on equalization voltage, duration, schedule, and advisability. Do not equalize any battery unless approved by the manufacturer.
⚠️	**CAUTION: Battery Damage** Do not equalize sealed gel batteries; this will destroy them. Do not equalize any other battery types unless approved by the manufacturer.

This menu controls the settings for the equalization process, which is used for battery maintenance. See the charge controller *User's Manual* for an explanation of equalization and how it relates to the regular charging process.

To access the *Battery Equalize* **menu:**

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Battery Equalize** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 94   Battery Equalize

Set Points:

➢ **Equalization Voltage:** Adjusts the voltage of the Equalization cycle.

➢ **Hours:** Adjusts the duration of the Equalization timer, once the voltage has been reached.

➢ **Automatic Battery Equalization:** Sets the charge controller on an automatic schedule which will begin a new equalization cycle after a certain number of days. If this number is set to 0, the automatic schedule is disabled.

Grid Tie Mode

📖ℹ️ **IMPORTANT:**
Grid-Tie Mode requires an inverter that is grid-interactive, (also known as grid-tied or grid-tie enabled.) Not all inverters are grid-interactive. If the MATE3 is connected to an inverter that is not grid-interactive, Grid-Tie Mode will not function if selected.

This menu allows the charge controller to work more effectively with any grid-interactive inverters present on the HUB. When enabled, this setting automatically raises the charge controller's Float voltage to equal its Absorption voltage. Since the inverter sells power to maintain its own Float, Absorption, or Sell settings (all of which should be lower than those of the controller), this mode makes it easier for the inverter to sell power.

NOTE: The charge controller's Float voltage returns to normal any time the inverter enters *PassThru* or *Silent* modes. (See page 37.)

To access the *Grid Tie Mode* **menu:**

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Grid Tie Mode** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the *Main Menu* screen.

Figure 95   Grid Tie Mode

Set Points:

➢ Two options are available in this menu; *N* and *Y*.

    ~ *N* (No) disables Grid-Tie Mode;
    ~ *Y* (Yes) enables it.

Auxiliary Output

This menu controls the output and functionality of the Auxiliary (AUX) output.   The charge controller's AUX terminals provide a 12 Vdc output that can deliver up to 0.2 Adc to control external loads. Typical loads include signaling a generator to start, sending a fault alarm signal, or running a small fan to cool the inverter. See the charger controller *User's Manual* for more information on hooking up the AUX terminals.

To access the *Auxiliary Output* **menu:**

1.   Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2.   Use the control wheel to highlight the **Auxiliary Output** menu.
      Press the button in the center of the control wheel to accept the selection.

3.   Use the control wheel to increase or decrease the set points to the correct voltage.
      Press the button in the center of the control wheel to accept the selection.
      This should automatically move the highlighting to the next set point.

4.   After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 96   Auxiliary Output

Set Points:

➢   **Status**: The **Auxiliary Output** status is controlled by the <**Off**>, <**Auto**>, and <**On**> soft keys.

   ~   **<On** >activates the **Auxiliary Output** immediately. It will display the message **Manual On** and remain continuously active until <**Off** > is selected.
   ~   **<Auto>** sets the **Auxiliary Output** to be triggered by automatic criteria, according to the option selected in Aux Mode. When triggered, it displays the message **Auto On**; otherwise it displays **Auto Off**.
   ~   **<Off>** disables the **Auxiliary Output** and prevents any of the charge controller's automatic AUX options from working. When <**Off>** is selected, it will display **Manual Off**. Note that even if the AUX output is set to Off, it may still be triggered by an external option not based in the charge controller, such as AGS. (See page 114.)

➢   **Aux Mode**: Selects one of nine options with automatic criteria. The options appear in the following order when the wheel is drawn clockwise. The **Vent Fan** option appears first if the charge controller is set at factory default values; otherwise, it will tend to display the last option selected. (The options are described in greater detail in the charge controller *User's Manual*.)

   ~   **Vent Fan** enables the AUX output in response to high DC (battery) voltage. It can run a small fan to ventilate the battery compartment to eliminate gases that result from battery charging.

♦ This option has settable DC voltage and time parameters.

Set Points:

➢ *Enable Voltage:* Adjusts the high-voltage setting at which the AUX output is enabled.

Figure 97   Vent Fan

~ *PV Trigger* enables the AUX output any time the PV voltage exceeds the specified number. Among other things, this can be used for an alarm or an emergency relay if the Voc runs dangerously high.

♦ This option has settable DC voltage and time parameters.

Set Points:
➢ *Enable Voltage:* Adjusts the high-voltage setting at which the AUX output is enabled (assuming *Active High.)*

➢ *Hold Time:* Adjusts the time delay after reaching the *Enable Voltage* setting, before the AUX output is enabled.

➢ *Active: High* or *Low*. *Active High* enables the AUX output when conditions are met; *Active Low* disables the output when the same conditions are met but enables it the rest of the time.

Figure 98   PV Trigger

~ *Error Output* responds to two emergency conditions: low battery or failure to charge. Low battery is defined by a set point. Failure to charge is defined by the PV voltage failing to exceed 3 Vdc above the battery voltage for 26 consecutive hours. This option usually indicates an array problem and is meant to trigger an alarm. Note: This option is "Active Low" only. The AUX output is enabled as long as these conditions are not met. If they are met, the output is disabled.

♦ This option has settable DC voltage and time parameters.

Set Points:
➢ *Low Battery Voltage:* Adjusts the low-voltage setting at which the AUX output is disabled.

Figure 99   Error Output

~ **Night Light** uses the PV voltage as a light sensor. When it drops below a settable voltage (due to low light), the AUX output becomes enabled for the purpose of turning on a light. It remains on for a settable amount of time.

🔴 This option has settable DC voltage and time parameters.

Set Points:

➤ **Active: High** or **Low. Active High** enables the AUX output when conditions are met; **Active Low** disables the output when the same conditions are met but enables it the rest of the time.

➤ **Threshold:** Adjusts the low-voltage setting at which the AUX output is enabled (following the **Hysteresis Time**).

➤ **ON Time:** Adjusts the amount of time that the AUX output will remain enabled once active.

➤ **Hysteresis Time:** Adjusts the delay time between reaching **Threshold** and the AUX being enabled.

Figure 100   Night Light

~ **Float** enables the AUX output when the charge controller enters the Float stage of charging. This may be used to activate functions which require the batteries to be fully charged. This mode is shown in Figure 96.

~ **Diversion: Relay** enables the AUX output upon reaching the target voltage for charging. The output is used to energize a standard relay for controlling a diversion load.

~ **Diversion: Solid St** enables the AUX output upon reaching the target voltage for charging. The output is pulse-width-modulated (PWM) for exact control. It is used to run a solid-state device for controlling a diversion load.

🔴 This option has settable DC voltage and time parameters.

Set Points:

Note: All items function identically for both **Diversion: Relay** and **Diversion: Solid St**, except for **Active: High** or **Low**. All items are written assuming **Active High** logic.

➤ **Diversion:Relay**

➤ **Diversion: Solid St**

~ **Active: High** or **Low. Active High** enables the AUX output when conditions are met; **Active Low** disables the output when the same conditions are met but enables it the rest of the time. (Not available in **Diversion: Solid St.**)

~ **Relative Voltage:** Enables the AUX output within a certain range of the target voltage (Float, Absorb, etc.). This setting controls the range.

~ **Hysteresis:** Once the AUX output is enabled, this setting adjusts the allowable voltage range for it to continue being enabled.

~ **Hold:** Sets the amount of time allowed after exiting the **Hysteresis** range before the AUX output is disabled. If the voltage re-enters the **Hysteresis** range before the timer expires, the timer resets.

~ **Delay:** Adjusts the delay time before the AUX output is enabled upon reaching the **Relative Voltage.**

Figure 101   Diversion:Relay and Diversion: Solid St

~ *Low Batt Disconnect* enables the AUX output upon reaching a settable low-battery voltage. This option is intended as a low-battery disconnect function for DC loads.

➡ This option has settable DC voltage and time parameters.

Set Points:

➢ *Disconnect:* Adjusts the low-voltage setting at which the AUX output is enabled, followng the *Disconnect Delay.*

➢ *Re-Connect:* Adjusts the setting at which the AUX output is disabled again after reaching *Disconnect.*

➢ *Disconnect Delay:* Adjusts the time delay after reaching the *Disconnect* setting, before the AUX output is enabled.

Figure 102   Low Batt Disconnect

~ *Remote* allows the AUX output to be enabled in response to manual or automatic commands based in the MATE3 (such as AGS).

Remote and *Float* have no adjustable settings.

Restart Mode

This setting allows the user to choose between continuous MPP tracking, or occasional restarts of the sweeping process. A restart means the controller abandons the existing maximum power point and "re-sweeps", or begins gathering new power point data.

To access the *Restart Mode* menu:

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Restart Mode** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct selection.
   Press the button in the center of the control wheel to accept the selection.
   This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 103   Restart Mode

Set Points:

➢ *0:* Initial sweep and then continuous MPP tracking.

➢ *1:* Automatic re-sweep every 90 minutes if controller is in an MPPT mode (MPPT Float, MPPT Bulk, etc).

➢ *2:* Automatic re-sweep every 90 minutes if controller is in any charging mode.

Calibrate

The Calibrate menu allows adjustment of the charge controller's battery voltmeter. If a particular controller's readings do not match those of another device, or a handheld meter, the calibration feature may improve consistency.

To access the *Calibrate* menu:

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Calibrate** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage. Press the button in the center of the control wheel to accept the selection. This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
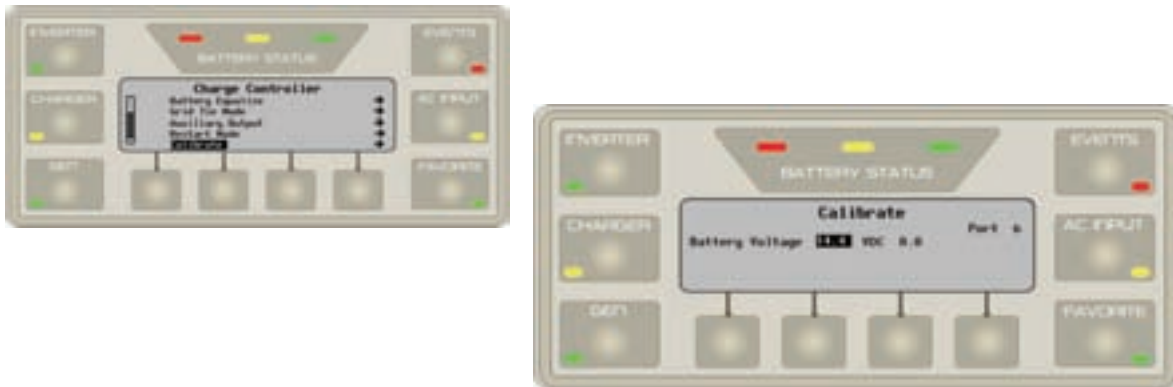
Figure 104   Calibrate

Set Points:

➢ **Battery Voltage:** Calibrates the DC voltage measurement made at the charge controller's battery terminals.

➢ Figure 104 shows the current reading being taken by the charge controller in Vdc. However, the field to the right is the calibration setting.

Note: Calibration does not change the actual voltage of the charge controller, only the reading of that voltage.

Also, measurements in places other than the charge controller's terminals may differ regardless of calibration. For example, it is possible to get a different reading at the charge controller's DC terminals than on the batteries. Connection problems, corrosion, and the effects of induction and resistance may all result in voltage differences. If this occurs, note that this is an issue with the system, not the inverter. Calibration cannot correct for it.

Reset to Factory Defaults

This menu allows the user to erase all settings from the selected charge controller and start over with the values programmed at the factory. These values are listed in the charge controller *User's Manual.*

To access the *Reset to Factory Defaults* **menu:**

1. Access the **Charge Controller** menu as shown in Figure 90 on page 94.

2. Use the control wheel to highlight the **Reset to Factory Defaults** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the soft keys below the LCD to select **No** or **Yes**.

    ~   If <**No**> is selected, the screen returns to the **Charge Controller** menu. No changes will be made to any settings.

    ~   If <**Yes**> is selected, the inverter's settings will immediately change to the original factory values. The screen will display the message **Charge Controller Restored to Factory Defaults.** A <**Continue**> soft key will appear. Pressing this key will return the screen to the **Charge Controller** menu.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

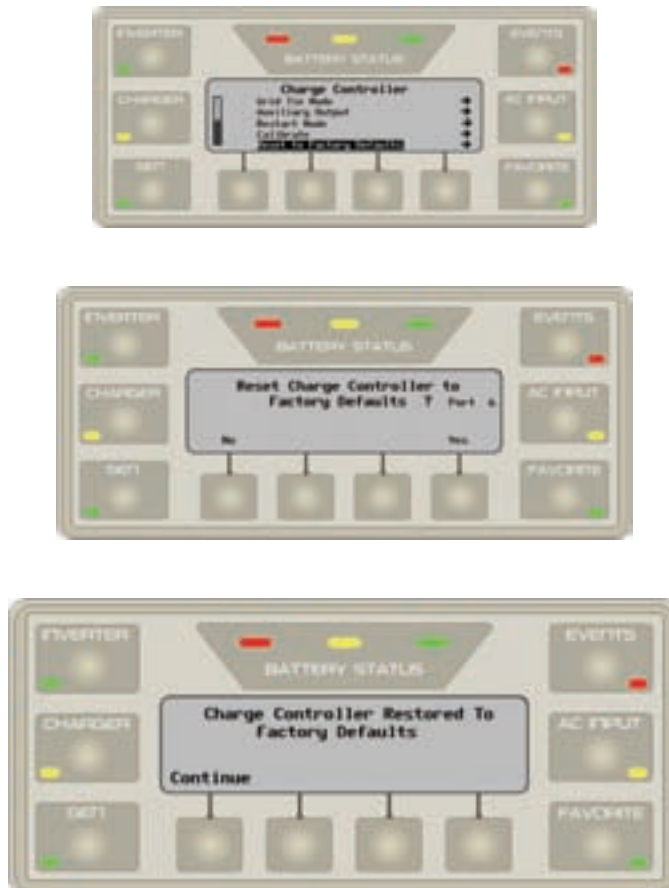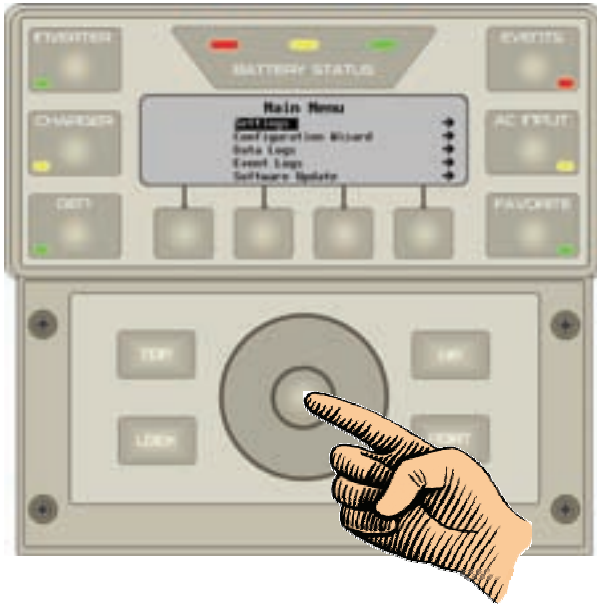**Figure 105   Resetting Factory Default Settings on the Charge Controller**

Battery Setup

This menu allows the user to set the parameters for the battery bank in that particular system. These figures are used by the FLEXnet DC battery monitor to track the status of the battery bank. (Many of these figures must be given by the battery manufacturer.) For more information on the battery monitor, see the *User's Guide* for the FLEXnet DC.

To access the *Battery Setup* **menu:**

1. Access the **Battery Monitor** menu as shown in Figure 106.

2. Use the control wheel to highlight the **Battery Setup** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
   Press the button in the center of the control wheel to accept the selection.
   This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 107   Battery Setup

Set Points:

➢ **Battery Amp-hours:** Identifies the total size of the battery bank in amp-hours.

➢ **Charged Voltage:** Sets the minimum voltage the three-stage charger must reach during the Bulk or Absorption stages for the battery monitor to consider the batteries fully charged.

➢ **Charged Return Amps:** Sets the limit to which the charging current must "trickle down" or decrease before the batteries are considered charged.

➢ **Time:** Sets the duration the **Charged Voltage** and **Charged Return Amps** must be maintained before the charging cycle is considered finished.

➢ **Charge Factor:** Adjusts the anticipated charging efficiency of the batteries. Because the batteries cannot be 100% efficient, the battery monitor discounts a certain percentage of the energy used to charge them. This provides a better estimate of their capacity.

Shunt Enable

This menu allows the user to turn on or off any of three shunts (current sensors) used by the battery monitor. For more information on the use of each shunt, see the *User's Guide* for the FLEXnet DC.

To access the *Shunt Enable* menu:

1. Access the **Battery Monitor** menu as shown in Figure 106.

2. Use the control wheel to highlight the **Shunt Enable** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct set point.
   Press the button in the center of the control wheel to accept the selection.
   This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 108   Shunt Enable

Set Points:

The settings for each shunt are *Y* (yes) and *N* (no). *Y* instructs the battery monitor to monitor a particular shunt and measure the current running through it. *N* instructs the battery monitor to ignore that shunt.

Relay Mode

This menu allows the user to turn on or off an internal relay. The contacts of this relay are rated for 5 amps at 30 Vdc. (This relay provides no voltage of its own.) The relay can be used as a switch to turn other devices on or off. For more information on the battery monitor, see the **Relay Set Points** menu, and the *User's Guide* for the FLEXnet DC.

To access the *Relay Mode* menu:

1. Access the **Battery Monitor** menu as shown in Figure 106.

2. Use the control wheel to highlight the **Relay Mode** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct set point.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 109   Relay Mode

Set Points:

➢   **Status**: The Relay output status is controlled by the <**Off**>,<**Auto**>, and <**On**> soft keys.

   ~   <**On**> activates the relay immediately. Its contacts will remain continuously closed until Off is selected.
   ~   <**Auto** > sets the relay to be triggered by automatic criteria, according to the option selected in **Relay Set Points**.
   ~   <**Off**> disables the relay and prevents any of the **Relay Set Points** options from working. Note that even if the relay output is set to **Off**, it may still be triggered by an external option not based in the battery monitor, such as AGS. (See page 114.)

➢   **Invert Logic:** Switches the relay 's function from N.O. (a normally open state) to N.C. (a normally closed state). The selections are **N** (no) and **Y** (yes). Since the default condition is N.O., the **N** selection means it remains in this state. Selecting **Y** inverts the logic to N.C. The relay will close with an audible click when this occurs.

Relay Set Points

This menu allows the user to adjust the criteria used by the Auto selection in the Relay Mode menu. For more information on these criteria, see the *User's Manual* for the battery monitor.

To access the *Relay Set Points* menu:

1. Access the **Battery Monitor** menu as shown in Figure 106.

2. Use the control wheel to highlight the **Relay Set Points** menu.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to increase or decrease the set points to the correct voltage.
    Press the button in the center of the control wheel to accept the selection.
    This should automatically move the highlighting to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

Figure 110   Relay Set Points

Set Points:

The following set points assume N.O. logic. If N.C. logic is used, all use of the words "close" or "open" are reversed.

➢ **Voltage: High:** The relay will close upon reaching a specified high voltage level (following the appropriate delay; see below).

➢ (Voltage) **Low:** After the relay was closed according to the **High** voltage set point, it will open again upon reaching a specified low voltage level (following the appropriate delay; see below).

➢ **SOC: High:** If voltage conditions are not met, the relay will close when the battery state of charge (SOC) increases to a specified percentage (following the appropriate delay; see below).

➢ (SOC) **Low:** After the relay was closed according to the **High** SOC set point, it will open again upon reaching a specified low SOC level (following the appropriate delay; see below).

➢ **Delay: High:** Sets the delay time before the relay closes due to a **High** set point. This applies to either the SOC or voltage settings.

➢ (Delay) **Low:** Sets the delay time before the relay opens due to a **Low** set point. This applies to either the SOC or voltage settings.

Reset to Factory Defaults

This menu allows the user to erase undesirable settings from the battery monitor and start over with the values programmed at the factory. These values are listed in the *FLEXnet DC Owner's Manual*.

To access the *Reset to Factory Defaults* menu:

1. Access the **Battery Monitor** menu as shown in Figure 106.

2. Use the control wheel to highlight the **Reset to Factory Defaults** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the soft keys below the LCD to select **No** or **Yes**.

   ~   If <**No**> is selected, the screen returns to the **Battery Monitor** menu. No changes will be made to any settings.

   ~   If <**Yes**> is selected, the battery monitor's settings will immediately change to the original factory values. The screen will display the message **Battery Monitor Restored to Factory Defaults.**
       A <**Continue**> soft key will appear. Pressing this key will return the screen to the **Battery Monitor** Menu.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
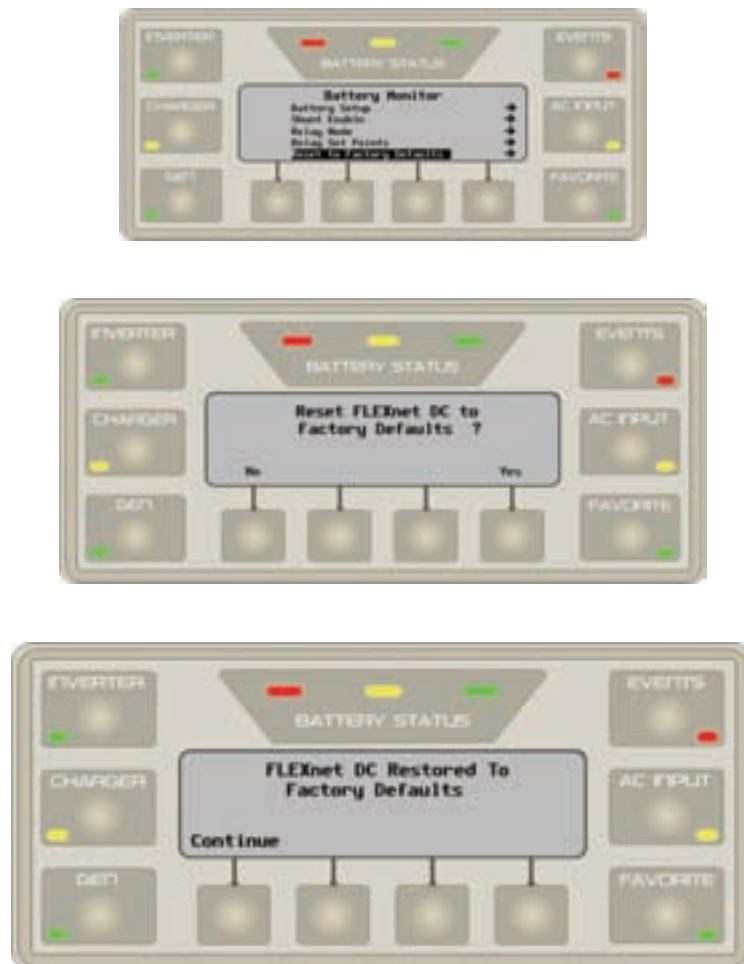
Figure 111   Reset FLEXnet DC Monitor to Factory Defaults

MATE Settings

MATE Settings Menus include::

To access the *MATE Settings* Menu Option:

1. From the **Main Menu**, access the **Settings** Menu (see Figure 56).

2. Use the control wheel to scroll down to the **MATE** Menu.

3. Press the button in the center of the control wheel to accept the selection.
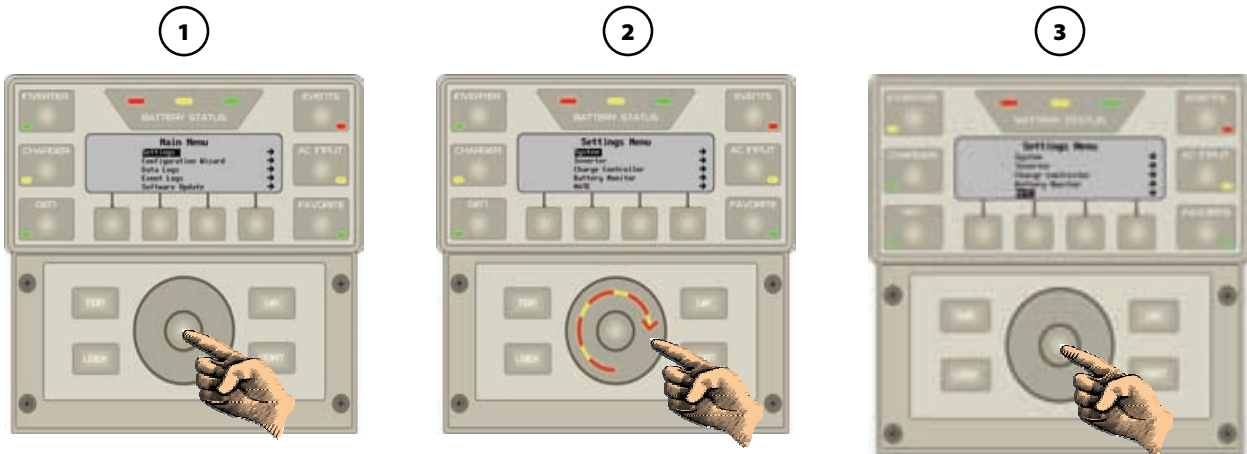
Figure 112   Accessing the MATE Settings Menu

To scroll down to the next menu or increase the value of the setting:

➡ Touch the control wheel and make a *clockwise* circle (circle to the right).

To scroll up to the previous menu or decrease the value of the setting:

➡ Touch the control wheel and make a *counter-clockwise* circle (circle to the left).

To select the menu item:

➡ Press the button in the center of the control wheel.

Figure 113   Accessing the MATE Menu Items

Advanced Generator Start (AGS) Mode

⚠️ **CAUTION: Equipment Damage**
This feature can damage the generator or the batteries if either are not properly maintained. Be sure to follow all maintenance requirements for all the components in the system to prevent unnecessary and expensive damage.

The AGS Mode utilizes the auxiliary (AUX) output on the inverter or charge controller (or the FLEXnet DC relay output) and is compatible with any two-wire start generator.

AGS starts the generator any time when any of its Start conditions are met, and stops the generator when any of its Stop conditions are met. A Quiet Time schedule overrides most of the Start conditions to keep the generator from running at inappropriate hours.

NOTE: If AGS mode controls the AUX output of a FLEXmax charge controller, that charge controller's **Auxiliary Output** menu must be set to **Remote** for this function to work. (See page 103.)

AGS can start a generator under the following variety of settings:

➢ **Voltage Start** --- >   See page 118.
➢ **Load Start** -- >   See page 119.
➢ **State of Charge % Start (FLEXnet DC)** ------------- >   See page 120.
➢ **Must Run Schedule** -- >   See page 121.
➢ **Quiet Time Schedule** ------------------------------------- >   See page 122.
➢ **Exercise** --- >   See page 123.

Gen Alert is another way to automatically start a generator, but it does not offer the same range of programming options as AGS. AGS is a function of the MATE3 while **Gen Alert** is a function of the inverter, which is programmed using the MATE3. Information on the **Gen Alert** function can be found in the inverter *Operator's Manual*.

Figure 114   Advanced Generator Start (AGS) Menu

AGS Setup

To access the AGS *Setup* Screen:

1. Access the **MATE** Menu as shown Figure 113.

2. Use the control wheel to select the **Advanced Generator Start** menu option.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to select the **Setup** menu item.
   Press the button in the center of the control wheel to accept the selection.

4. Use the control wheel to increase or decrease each set point value, as required.
   Press the button in the center of the control wheel to enter the value.
   When the value is entered, the highlighting will move forward to the next set point.

5. After setting the parameters for each set point, press the TOP navigation key to return to the
   Main Menu screen.
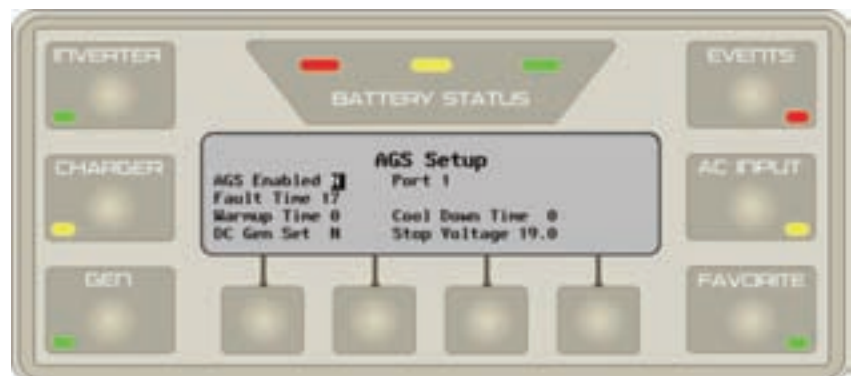
Figure 115   AGS Setup Screen

Set Points:

➤ **AGS Enabled** either enables (**Y**) or disables (**N**) the AGS mode.

➤ **Port** identifies the HUB port (**1 – 10**) for the device that is going to control the generator.

~ If there is only one inverter in the system and no OutBack HUB is used, it is necessary to set the
   AGS Port to zero (0).

~ If a HUB is used, adjust the port number to the port that is assigned to the device that is going to
   control the generator.

> *In an example of a common configuration:*
> > Ports 1-4 are for the inverters.
> > Ports 5-7 are for the charge controllers.

~ It will be necessary to choose which device is going to control the generator (1, 2, 3, or 4) and set that number as the AGS port in that menu.

➢ **Fault Time** is the period the generator is given to connect to the inverter system after the AUX output has been activated. If the generator fails to connect and provide AC current during this time, the MATE3 displays an **AGS Fault** message on the Gen screen. A fault is added to the event log and the event LED will illuminate. This set point can be anywhere from 5 to 30 minutes.

➢ **Warmup Time** for the generator (in minutes). Before charging begins, the **Warmup Time** allows the user to adjust the number of minutes the generator will be allowed to run with no load. This time can be from 0 to 30 minutes, but should follow the generator manufacturer's recommendations.

➢ **Cool Down Time** for the generator (in minutes). After charging has been disabled, the **Cool Down Time** set point allows the user to adjust the number of minutes the generator will run with no load before being shut off. This time can be from 0 to 30 minutes, but should follow the generator manufacturer's recommendations.

📖ℹ	**IMPORTANT:** Cool Down and Warm-up times are disabled when a DC generator is used.

➢ **DC Gen Set** identifies if a DC generator is used, instead of an AC generator. The AGS will stop the generator when the **Stop Voltage** setting is reached instead of when the float voltage set point or Silent mode is reached. The **Stop SOC %** setting (see page 120) can also be used to stop a DC generator.

📖ℹ	**IMPORTANT:** If an AC generator is being used, this menu item must be set to NO.

➢ **Stop Voltage** level. This voltage setting will terminate a voltage start command when the battery voltage remains above it for 15 minutes. This setting only takes effect when **DC Gen Set** is selected.

AGS Functional Test

Before any further programming, confirm that the generator is working properly.   Using the generator's own controls, manually turn it on and then shut it off.

Next, test the remote start functionality by using the MATE3's Generator Status screen.
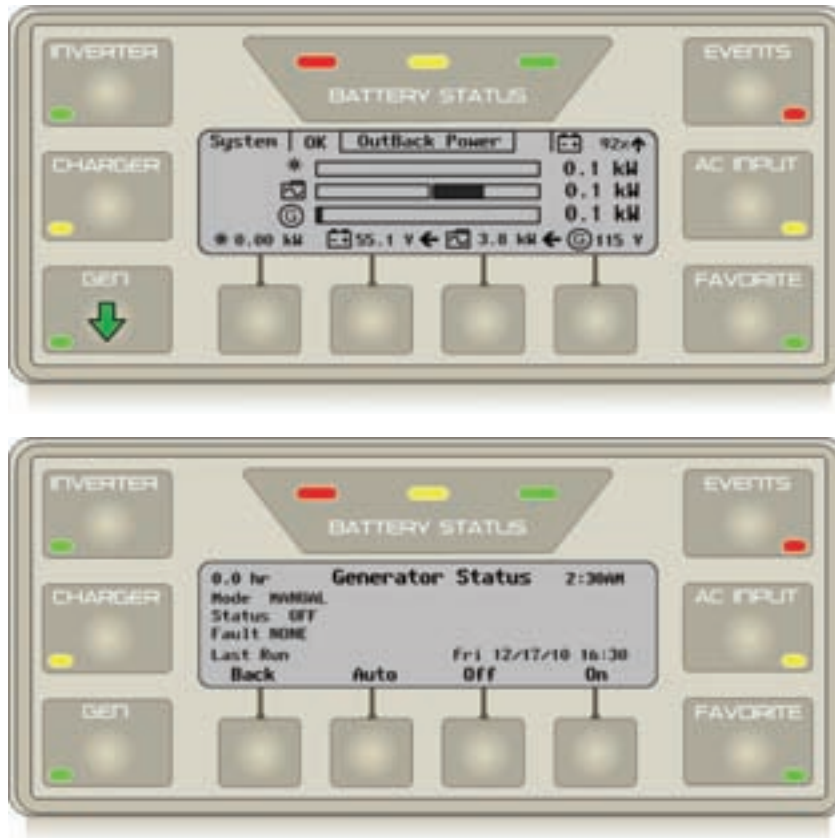
To Test the AGS function through the MATE3:

1. Press the ᴳᴱᴺ hot key to brings up the *Generator Status* screen.

2. Press the **<ON>** soft key and wait for the generator to start running.

3. Press the **<OFF>** soft key to shut the generator off.

4. Press the **<AUTO>** soft key to put the generator in AUTO mode.

5. Press the **<BACK>** soft key to return to the Main screen.

Figure 116   AGS Functional Test

The AGS test confirms the AGS function works and the generator has been enabled during the AGS programming.

> **IMPORTANT:**
> It is important not to confuse AGS with Gen Alert. These are two separate methods for requesting a generator start. Gen Alert set points should not be used as AGS set points.

AGS Voltage Start

There are three voltage start set points in AGS mode that the user can select.

➢ *24 Hr Start*
➢ *2 Hr Start*
➢ *2 Minute Start*

If the voltage drops below the voltage setting in these three menu items, a timer starts counting down. When the timer reaches zero (0), a start command is sent to the generator. The **Quiet Time** settings overrides the starting set points, preventing the generator from starting automatically. The exception is *2 Minute Start*, which is considered an "emergency" start set point and which will start the generator regardless of **Quiet Time** settings.

After a generator is started due to a **Voltage Start** setting, it will be stopped when the inverter completes the absorb charge or based on the **DC Genset** setting in the **AGS Setup** menu.

IMPORTANT:
If the DC Genset is set to YES, the generator will only stop after the battery voltage has reached the **DC Genset** voltage for 15 minutes, or the **SOC Stop %** setting.

To Enable the AGS to start the generator based on battery voltage:

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to select the **Advanced Generator Start** menu option.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight **Voltage Start**.
   Press the button in the center of the control wheel to select the menu item.

4. Use the control wheel to select **N** for no (disabled) or **Y** for yes (enabled) for each set point.
   Press the button in the center of the control wheel to accept the selection.
   This should advance the highlighting to the next set point.

5. Press the TOP navigation key to return to the **Main Menu** screen.

Set Points:

➢ *24 Hr Start Enable* :
   N=No, *Y*=Yes
   Voltage xx.x (inverter dependent)
➢ *2 Hour Start Enable* :
   N=No, *Y*=Yes
   Voltage xx.x (inverter dependent)
➢ *2 Minute Start Enable* :
   N=No, *Y*=Yes
   Voltage xx.x (inverter dependent)

Figure 117   MATE/AGS/Voltage Start Screen

AGS Load Start

Load Start will start a generator whenever the total system AC load wattage exceeds the *Start* set point for the programmed amount of time (*Delay*). The generator will then be stopped when the AC load has dropped below a *Stop* set point for a programmed amount of time (*Delay*).

When the generator is running because of *Load Start*, the inverter system will charge the batteries. However, it is not programmed to perform a complete charge cycle. This charge might not be completed if the generator is disconnected because of a *Stop* command.

> **IMPORTANT:**
> Large, instantaneous loads can still overload the inverter prior to the generator starting and getting sychronizing with with the inverter.
> See the inverter *Operator's Manual* for instructions on resetting the system if an over-current fault occurs.

To enable the AGS to start the generator based on load wattage :

1. Access the *MATE* menu as shown in Figure 113.

2. Use the control wheel to select the *Advanced Generator Start* menu option.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight *Load Start*.
   Press the button in the center of the control wheel to select the menu item.

4. Use the control wheel to select *N* for No (disabled) or *Y* for Yes (enabled).

5. Press the TOP navigation key to return to the *Main Menu* screen.
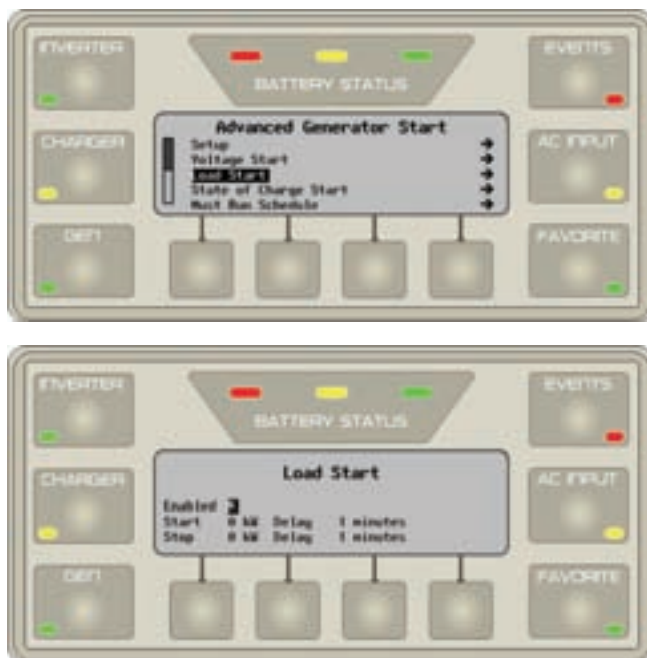
Set Points:

- ➢ **Enabled** : N=No, Y=Yes

- ➢ **Start**: 0 to 50 kW
  Delay 1 to 240 minute

- ➢ **Stop**: 0 to 49 kW
  Delay 1 to 240 minute

Figure 118   MATE/AGS/Load Start Screen

AGS State-of-Charge (SOC) Start

With a FLEXnet DC, a generator can be started or stopped based on the battery state-of-charge (SOC) rather than voltage. However, this feature may become less accurate if the system routinely cycles without obtaining a full charge for long periods of time.

The **Enable Full Charge** set point overrides the *Stop SOC* function by establishing a time period from 1 to 30 days when the batteries will be charged to 100% regardless of the SOC value.

When the FLEXnet DC *days since parms met* (see page 32) exceeds this 1 to 30 day user-determined time, the *Stop SOC* is ignored. The generator will run until the FLEXnet DC's charge parameters are met. Setting this value to zero (0) days will disable the function. (No full charge will occur).

To enable the MATE3 to start the generator based on the battery SOC:

1. Access the *MATE* menu as shown in Figure 113.

2. Use the control wheel to select the *Advanced Generator Start* menu option.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight *State of Charge Start*.
   Press the button in the center of the control wheel to select the menu item.

4. Use the control wheel to select *N* for No (disabled) or *Y* for Yes (enabled).

5. Press the **TOP** navigation key to return to the *Main Menu* screen.
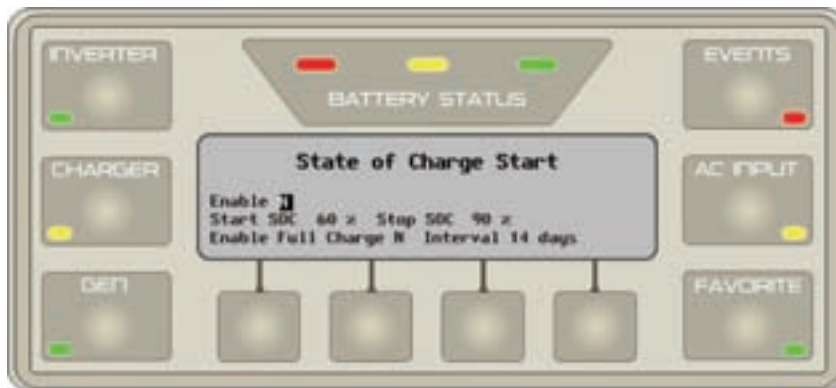
Set Points:

➢ *Enable*: *N* = No, *Y* = Yes
➢ *Start SOC:* 0 to 99%
➢ *Stop SOC:* 0 to 100%
➢ *Enable Full Charge:*
   N = No, *Y* = Yes

**Figure 119   MATE/AGS/State-of-Charge Start Screen**

AGS Must Run Schedule

Must Run Schedule time is a daily time period when the MATE3 commands the generator to run. This is usually set because large loads are expected to be present. *Must Run Schedule* times can be set individually for weekdays and weekends.

Setting start and stop times to the same time disables the **Must Run Schedule** function.

To enable the MATE3 to start the generator based on the *Must Run Schedule*:

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to select the **Advanced Generator Start** menu option.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight **Must Run Schedule**.
    Press the button in the center of the control wheel to select the menu item.

4. Use the control wheel to select **N** for no (disabled) or **Y** for yes (enabled).

5. Use the control wheel to increase or decrease the **Weekday Start** time.
    Press the button in the center of the control wheel to select the set point.

6. Use the control wheel to increase or decrease the **Weekday Stop** time.
    Press the button in the center of the control wheel to select the set point.

7. Use the control wheel to increase or decrease the **Weekend Start** time.
    Press the button in the center of the control wheel to select the set point.

8. Use the control wheel to increase or decrease the **Weekend Stop** time.
    Press the button in the center of the control wheel to select the set point.

9. Press the **TOP** navigation key to return to the **Main Menu** screen.
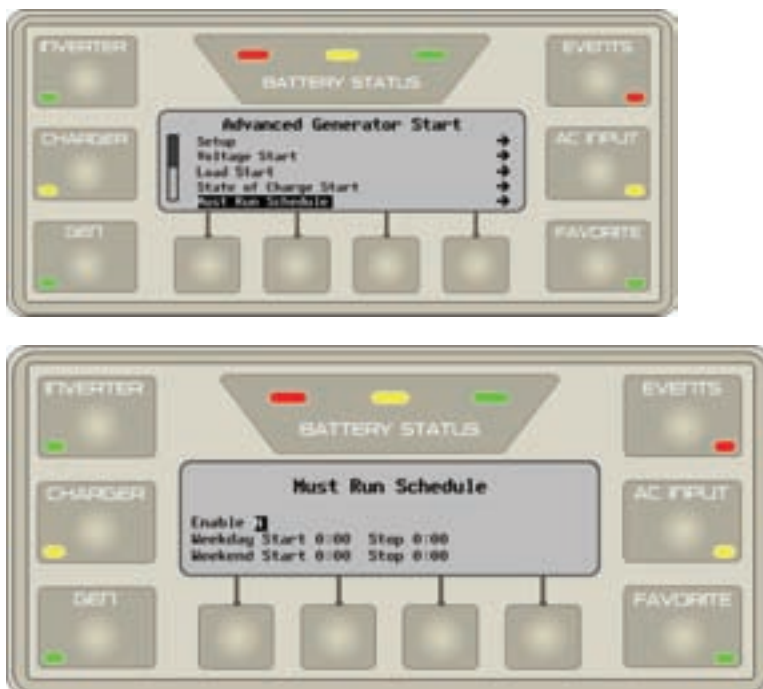
Set points:

➢ **Enable**: **N** = No, **Y** = Yes
➢ **Weekday Start**: 00:00 to 23:59
➢ Weekday **Stop**:   00:00 to 23:59
➢ **Weekend Start**: 00:00 to 23:59
➢ Weekend **Stop**: 00:00 to 23:59

Figure 120   MATE/AGS/Must Run Schedule Screen

AGS Quiet Time Schedule

Quiet Time is a period of time when the generator should not run, due to the risk of inappropriate noise or other reasons.

Setting start and stop times to the same time disables the **Quiet Time** function.

The **Quiet Time** settings overrides most of the "starting" set points (e.g., Voltage, Load, Must Run, Exercise etc.), preventing the generator from starting automatically. The only exception is the **2 Minute Start** under **Voltage Start**, which is considered an "emergency" start set point and which will start the generator regardless of **Quiet Time** settings.

To enable the MATE3 to start the generator based on the *Quiet Time Schedule*:

1. Access the **MATE** menu as shown in Figure 113.
2. Use the control wheel to select the **Advanced Generator Start** menu option. Press the button in the center of the control wheel to accept the selection.
3. Use the control wheel to highlight **Quiet Time Schedule**. Press the button in the center of the control wheel to select the menu item.
4. Use the control wheel to select **N** for no (disabled) or **Y** for yes (enabled). Press the button in the center of the control wheel to select the set point.
5. Use the control wheel to increase or decrease the **Weekday Start** time. Press the button in the center of the control wheel to select the set point.
6. Use the control wheel to increase or decrease the **Weekday Stop** time. Press the button in the center of the control wheel to select the set point.
7. Use the control wheel to increase or decrease the **Weekend Start** time. Press the button in the center of the control wheel to select the set point.
8. Use the control wheel to increase or decrease the **Weekend Stop** time. Press the button in the center of the control wheel to select the set point.
9. Press the **TOP** navigation key to return to the **Main Menu** screen.

Set points:

- ➢ **Enable**: **N** = No, **Y** = Yes
- ➢ **Weekday Start**: x0:00
- ➢ Weekday **Stop**: x0:00
- ➢ **Weekend Start**: x0:00
- ➢ Weekend **Stop**: x0:00

Figure 121   MATE/AGS/Quiet Time Schedule Screen

AGS Generator Exercise Schedule

Exercise is a time period when the generator is scheduled to run briefly, regardless of system conditions.

📖ℹ️	**IMPORTANT:** Regularly running a generator keeps engine components lubricated, expels excess moisture, charges the starting battery, and helps prevent carbon build-up. Consult the generator owner's manual for the appropriate length and frequency of exercise periods and what load to run during the exercise period.

To enable the AGS to start the generator based on the *Generator Exercise Schedule* screen:

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to select the **Advanced Generator Start** menu option.
    Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight **Generator Exercise Schedule** screen.
    Press the button in the center of the control wheel to select the menu item.

4. Use the control wheel to select **N** for No (disabled) or **Y** for Yes (enabled).
    Press the button in the center of the control wheel to select the menu item.

5. Use the control wheel to increase or decrease the **Start Time**.
    Press the button in the center of the control wheel to select the set point.

6. Use the control wheel to increase or decrease the **Run Period**.
    Press the button in the center of the control wheel to select the set point.

7. Use the control wheel to increase or decrease the **Exercise Interval**.
    Press the button in the center of the control wheel to select the set point.

8. Use the control wheel to select N (No) or Y (Yes) to **Disable Sell During Exercise**.
    Press the button in the center of the control wheel to select the set point.

9. Press the **TOP** navigation key to return to the **Main Menu** screen.

Set points:

➢ **Enable**: **N** = No, **Y** = Yes
➢ **Exercise Run on** Sun (Mon – Sun)
➢ **Start Time**   0:00 to 23:59
   Run Period   1 to 240 minutes
➢ **Exercise Interval** 0 to 8 weeks
➢ **Disable Sell During Exercise**
   N = No, **Y** = Yes

Figure 122   MATE/AGS/Generator Exercise Schedule Screen

Set Generator Total Run Time

The total running time for an automatic generator is displayed on the **Generator Status** screen, which is accessed with the Gen hot key. (See page 52.) This menu allows the timer to be set to a different figure, or to be reset to zero.

To adjust the *Set Total Generator Run Time* screen:

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to select the **Advanced Generator Start** menu option.
   Press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight **Set Tota Generator Run Time** screen.
   Press the button in the center of the control wheel to select the menu item.

4. Use the control wheel to increase or decrease the **Generator Total Run Time**.
   Press the button in the center of the control wheel to select the set point. Once set, the timer on the **Generator Status** screen will proceed from this time.

5. Use the **<Reset>** soft key to reset the timer to zero.

6. Press the TOP navigation key to return to the **Main Menu** screen.

Set points:

➢ **Generator Total Run Time**:
   0.0 – 999.9

Figure 123   MATE/AGS/Set Generator Total Run Time

Display AGS Timers

The **Display AGS Timers** screen is a read-only screen that provides the following information.

➢ **Fault** begins counting from zero when no voltage is detected after a generator start. When the **Fault Time** setting is reached according to the **AGS Setup** screen on page 115, an AGS fault will be generated and an event will be recorded (see page 53).

➢ **Warmup**, **Cooldown**, **Exercise**, and **DC Stop** begin counting from zero when each stage begins. The generator will react accordingly when their respective times are reached according to the **AGS Setup** screen on page 115.

➢ **2 Min**, **2 Hour**, and **24 Hour** begin counting down from the maximum time when the respective conditions are reached for each setting. If any of these timers reach zero, the generator will be started.

➢ **Load Start** and **Load Stop** begin counting from zero when the respective conditions are reached for each setting. If either of these timers reach the delay time as set in the **Load Start** screen on page 119, the generator will be started or stopped as appropriate.

To view the *AGS Timers* **screen:**

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to select the **Advanced Generator Start** menu option.
   Then press the button in the center of the control wheel to accept the selection.

3. Use the control wheel to highlight **Display AGS Timers**.
   Press the button in the center of the control wheel to select the menu item.

4. Press the **TOP** navigation key to return to the **Main Menu** screen.
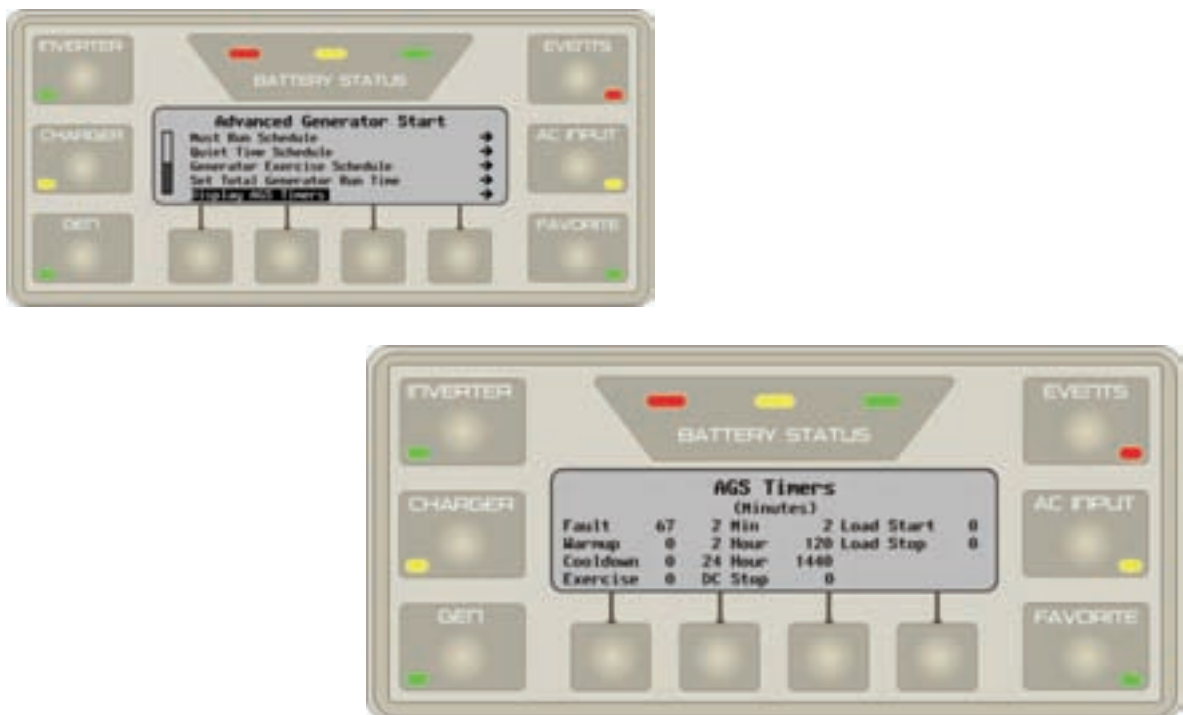

Figure 124   MATE/AGS/Display AGS Timers Screen

Programming of these values is done in the **Quiet Time Schedule, Voltage Start, Load Start, Must Run Schedule,** or **State of Charge Start** menus described on pages 118 through 120.

Data Logging

The Data Logging page enables the MATE3 to download information to an SD Memory Card. Information generated by this function will be saved on the SD card in a Microsoft Excel (.csv) file format.
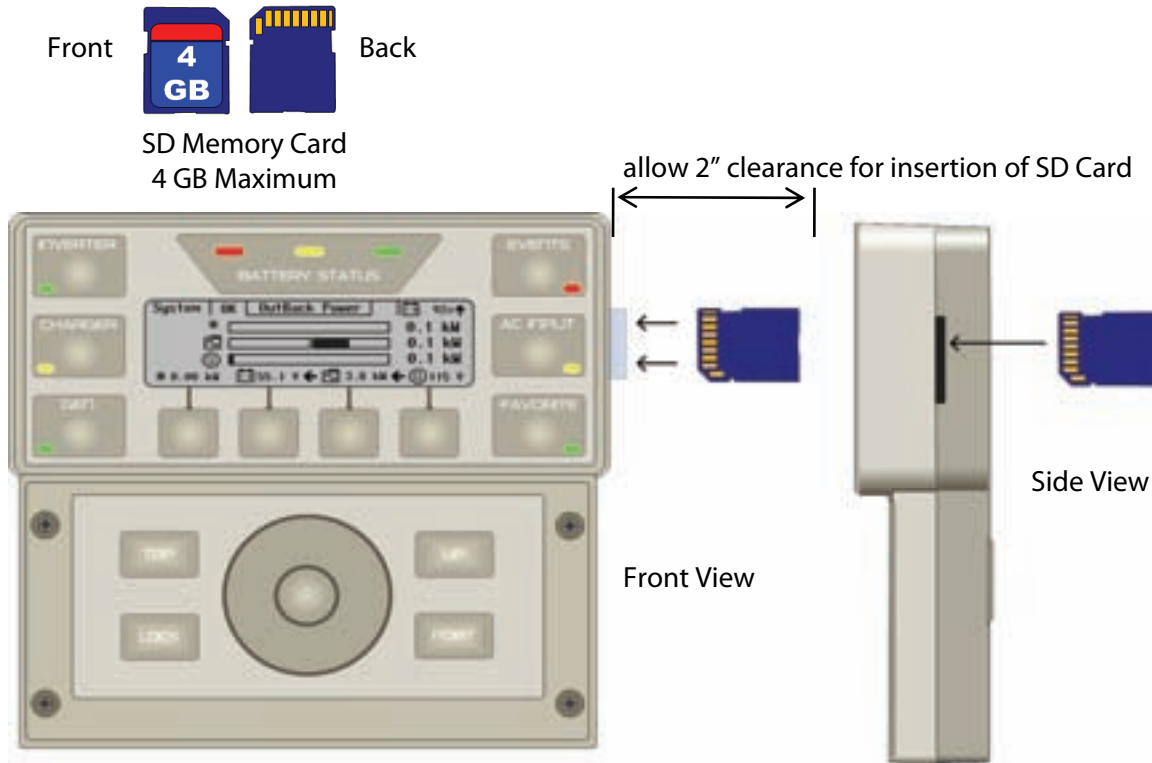
Front Back

SD Memory Card
4 GB Maximum

allow 2" clearance for insertion of SD Card

Side View

Front View

Figure 125   MATE3 Data Logging Screen

High Battery Transfer (HBX)

In High Battery Transfer (HBX) mode, the system is connected to an AC source such as the utility grid; however, it will use battery power as the first priority. The AC source is locked out until needed.

In this mode, the system runs on battery-supplied power for as long as the batteries can be sustained. It is expected that the batteries will also be charged from renewable sources such as PV power. When the batteries become depleted, the system reconnects to the AC source to operate the loads.

The batteries may be recharged during this time using the renewable source. When the batteries are recharged to a high enough voltage, the system transfers back to the batteries as the primary source (hence the name High Battery Transfer).

Note: For best operation, the inverter's charger should be turned off when HBX mode is in use. HBX mode is intended for systems that rely primarily on the renewable energy source for charging. The settings of HBX mode allow it to disconnect from the utility grid whenever it can charge effectively using the renewable source. Use of the inverter's charger may interfere with these priorities. This may keep both HBX mode and the inverter's charger from working effectively.

See page 48 (the CHARGER **hot key) for instructions on shutting off the charger function.**

HBX Mode commands the inverter to:

➢ connect to an AC source if the battery voltage has fallen below the *Grid Connect* voltage for the amount of time set in the (connect) *Delay* set point,

➢ connect to an AC source if the battery state of charge (SOC) has fallen below the *Grid Connect SOC* for any amount of time,

➢ disconnect the AC source and switch to powering the loads from the battery bank if the battery voltage has risen above the *Grid Disconnect* voltage for the amount of time set in the (disconnect) *Delay* set point, and

➢ disconnect the AC source and switch to powering loads from the battery bank if the battery state of charge (SOC) has risen abovethe *Grid Disconnect SOC* for any amount of time.

The *Delay* set points are used to prevent the inverter from switching to grid power in the event of a sudden, sizable demand for power that may momentarily drop the voltage below the *Grid Connect* value.

The *SOC* set points are only usable by a system equipped with a battery monitor.

Table 2   HBX Mode Default Set Points

System Voltage	12 V	24 V	48 V
High Voltage	13	26	52
Low Voltage	12	24	48
Time	1 hour	1 hour	1 hour

Note: The system must be in the *Grid Disconnect* state to allow HBX default settings to be changed.

IMPORTANT:
HBX Mode will control the master inverter in port 1 of a HUB-4 or HUB-10. The master will then instruct any stacked slaves to connect or disconnect from the AC input source.

IMPORTANT:
HBX Mode should not be used if *GRID USE TIME* is used (see page 129). These functions have incompatible priorities and will conflict with each other.

To enable or disable HBX Mode:

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to select the **High Battery Transfer** menu option.
   Press the button in the center of the control wheel to select the menu.

3. Use the control wheel to change **Enable** to **Disable**.
   Press the button in the center of the control wheel to accept the selection.

4. Use the control wheel to increase or decrease the value next to **Grid Connect**.
   Press the button in the center of the control wheel to select the set point.

5. Use the control wheel to increase or decrease the value next to **Grid Disconnect**.
   Press the button in the center of the control wheel to select the set point.

6. Use the control wheel to increase or decrease the value next to **Grid Connect SOC**.
   Press the button in the center of the control wheel to select the set point.

7. Use the control wheel to increase or decrease the value next to **Grid Disconnect SOC**.
   Press the button in the center of the control wheel to select the set point.
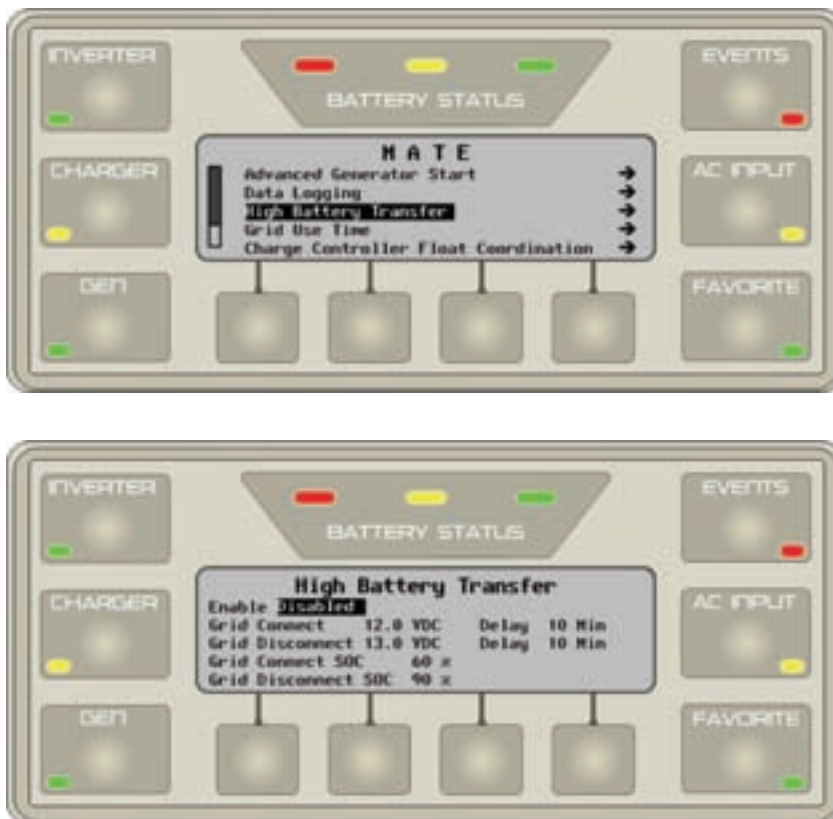
Set Points:

➢ **Enabled/Disabled**

➢ **Grid Connect** xx.x VDC
   (inverter dependent)
   Delay 0 to 240 minutes

➢ **Grid Disconnect** xx.x VDC
   (inverter dependent)
   Delay 0 to 240 minutes

➢ **Grid Connect SOC**
   10% to 100%

➢ **Grid Disconnect SOC**
   50% to 100%

Figure 126   MATE High Battery Transfer Screen

Grid Use Time

The Grid Use Time function allows the system to connect to the utility grid and disconnect from it on a timed schedule. **Grid Use Time** mode is programmed separately for weekday and weekend connect times. Only one **Grid Use Time** may be programmed on a weekend. Three **Grid Use Time** periods may be programmed on weekdays.

Before turning the **Grid Use Time** mode on, set all weekday and weekend time periods.

IMPORTANT:

➢ Care must be taken when programming weekday and weekend times that encompass **USE** periods past midnight (12:00 a.m.). The user must take into account weekday **USE** periods that will end on a Saturday.

➢ **Grid Use Time** should not be used if HBX mode is used (see page 127). These functions have incompatible priorities and will conflict with each other.

➢ The time and date must be accurately programmed for the **Grid Use Time** mode to function properly.

➢ The MATE3 does not automatically adjust its clock for Daylight Savings Time. This may affect timing of grid usage.

➢ If a start time equals a stop time, no action will be taken and the time period is ignored.

➢ If the battery voltage falls below the inverter's Low Battery Cut-Off voltage, the inverter will automatically connect to the AC input source regardless of the time-of-day setting.

Example #1:

Weekday Start - 6:00 p.m. Weekday Stop - 6:00 a.m.
Weekend Start - 12:00 a.m. Weekend Stop - 12:00 a.m.

The weekend **USE** period has been left at its default (12:00 a.m.). Any time that a Start time equals a Stop time, no action will be taken and the time period is ignored. The above settings will have the following results:

➢ Monday–Friday evenings at 6 p.m., the MATE3 issues a **USE** command to the inverter allowing the AC input source to be used.

➢ Monday–Friday mornings at 6 a.m., a **DROP** will be issued.

➢ On Friday evening at 6 p.m., a **USE** is issued but since the Weekend Start and Stop times are equal, the weekend use time is disabled; no **DROP** will be issued until Monday morning at 6 a.m.

Example #2:

Weekday Start - 6:00 p.m. Weekday Stop - 6:00 a.m.
Weekend Start - 4:00 p.m. Weekend Stop - 8:00 a.m.

➢ Monday–Thursday evenings at 6:00 p.m., the MATE3 issue a **USE** command to the inverter allowing the AC input source to be used.

➢ Monday–Friday at 6:00 a.m., a **DROP** is issued. On Friday evening at 6:00 p.m., a **USE** is issued.

➢ Saturday morning a **DROP** command is issued at 8:00 a.m. Saturday afternoon at 4:00 p.m., the inverter will **USE** again until Sunday morning at 8:00 a.m. Sunday evening at 4:00 p.m., a **USE** time period will start, ending on Monday morning at 6:00 a.m.

To program Grid Use Time:

1. Access the **MATE** Menu as shown in Figure 113.

2. Use the control wheel to select the **Grid Use Time** menu option.
   Press the button in the center of the control wheel to select the menu.

3. Use the control wheel to increase or decrease the value for each set point.
   Press the button in the center of the control wheel to enter the value.
   When the value is entered, the highlighting will move forward to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the
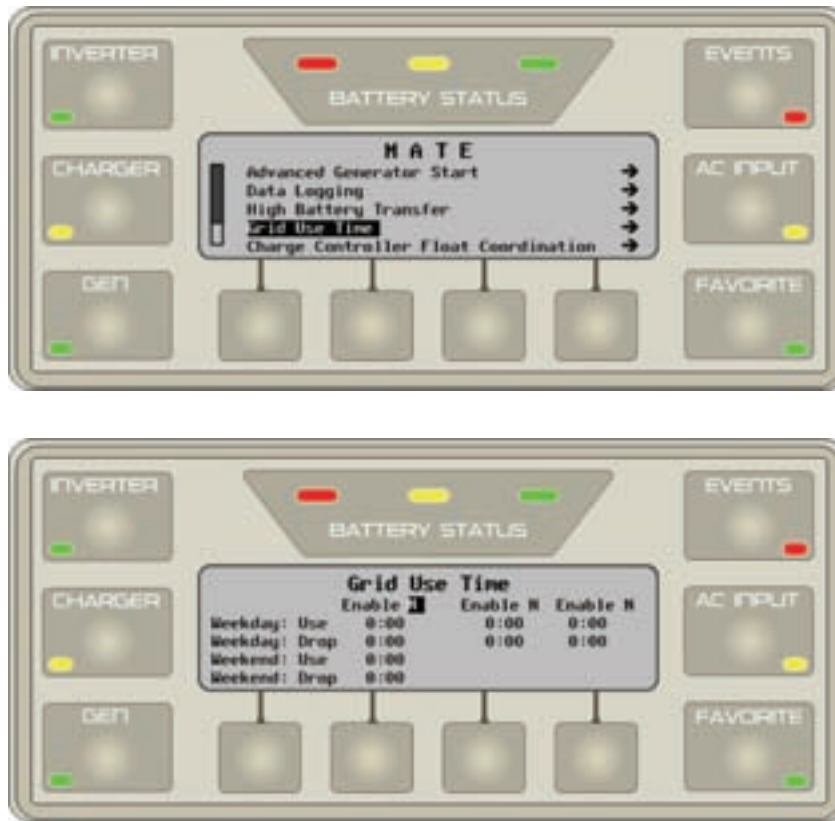   **Main Menu** screen.

Figure 127   MATE Grid Use Timer Screen

Set Points:

➤ **Enabled:** N = No, Y = Yes
➤ **Weekday: Use** 00:00 – 23:59 (three occurrences)
➤ **Weekday: Drop** 00:00 – 23:59 (three occurrences)
➤ **Weekend: Use** 00:00 – 23:59
➤ **Weekend: Drop** 00:00 – 23:59

Charge Controller Float Coordination

The advanced charger float control menu enables the coordination of more than one OutBack FLEXmax charge controller. This enables the devices to enter the float stage, or perform other activities, simultaneously rather than individually. Float Coordination means that when one charge controller finishes a bulk charge and moves into float charge, the MATE3 directs any other charge controllers in a float charge as well.

To program Charge Controller Float Coordination:

1. Access the **MATE** Menu as shown in Figure 113.

2. Use the control wheel to select the **Charge Controller Float Coordination** menu option. Press the button in the center of the control wheel to select the menu.

3. Use the control wheel to select **Y** (enabled) or **N** (disabled).

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
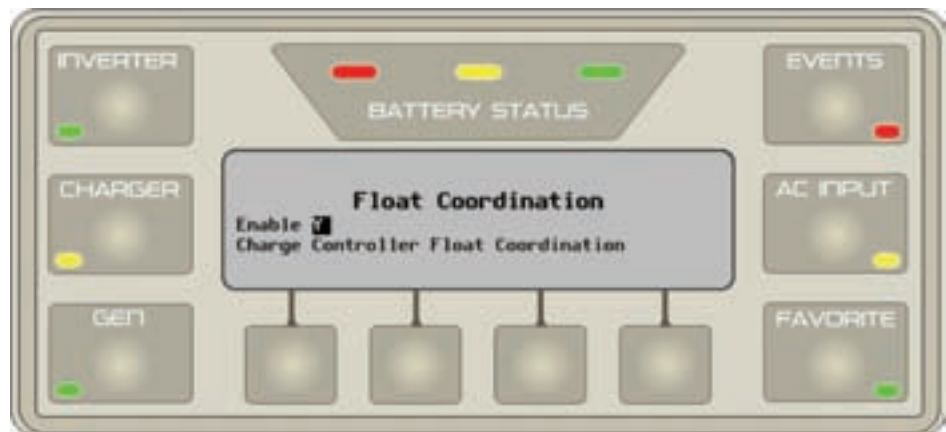

Figure 128   MATE Charge Controller Float Coordination Screen
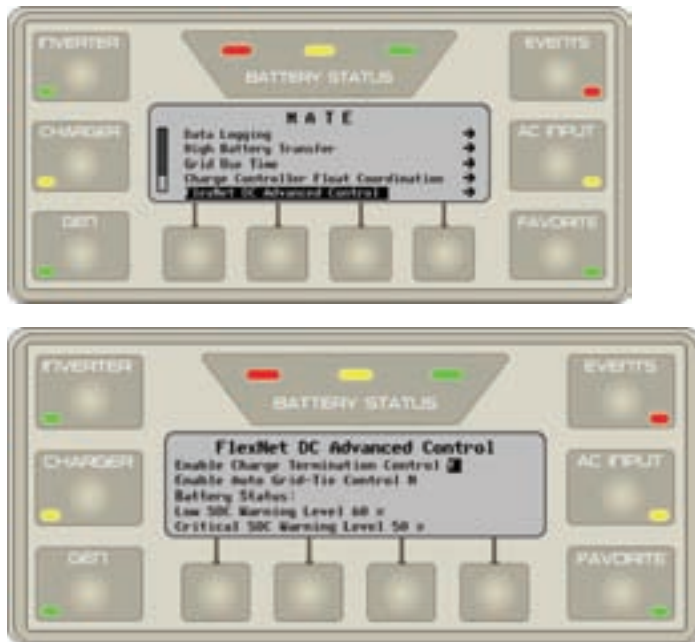
Set Points:

➢ **Enabled:** N = No, Y = Yes

FLEXnet DC Advanced Control

This menu allows certain advanced functions to be programmed into the FLEXnet DC. (The FLEXnet DC is required to be part of the system before any of these functions can be used.)

To program FLEXnet DC Advanced Control:

1. Access the **MATE** Menu as shown in Figure 113.

2. Use the control wheel to select the **FLEXnet DC Advanced Control** menu option.
   Press the button in the center of the control wheel to select the menu.

3. Use the control wheel to increase or decrease the value for each set point.
   Press the button in the center of the control wheel to enter the value.
   When the value is entered, the highlighting will move forward to the next set point.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.

See the *FNDC User's Guide* for detailed information about the FNDC functions.

Set Points:

➢ **Enable Charge Termination Control** allows the battery charging to be turned off for all inverters on the system, once the FLEXnet's charging parameters have been met. (See page 107 for these parameters.) Options are **N** (no) or **Y** (yes).

➢ **Enable Auto Grid-Tie Control** If grid-interactive inverters are present on the system, this function allows their grid-interactive function to be turned off at midnight each night. If grid-interactive inverters are not present, this item is inoperative. Options are **N** (no) or **Y** (yes).

The next two items are both related to the system indicators on the Home screen (see pages 25 and 141), and are titled **Battery Status** on the screen.

➢ **Low SOC Warning Level** If the batteries decrease to this state of charge (SOC), an event will be registered in the event log, and the Home screen will display ! ⊟, a battery warning. Settable range is 20% - 99%.\

➢ **Critical SOC Warning Level** If the batteries decrease to this state of charge (SOC), an event will be registered in the event log, and the Home screen will display X ⊟, a warning that the batteries have been critically discharged. Settable range is 10% - 98%.

Figure 129   FLEXnet DC Advanced Control

Reset to Factory Defaults Screens

This menu allows the user to erase all settings from the MATE3 and start over with the values programmed at the factory.

To reset the MATE3 to the factory-default settings:

1. Access the **MATE** menu as shown in Figure 113.

2. Use the control wheel to highlight the **Reset to Factory Defaults** menu.
   Press the button in the center of the control wheel to accept the selection.

3. Use the soft keys below the LCD to select **No** or **Yes**.

   ~ If <**No**> is selected, the screen returns to the **MATE** menu. No changes will be made to any settings.

   ~ If <**Yes**> is selected, the MATE3's settings will immediately change to the original factory values. The screen will display the message **MATE Restored to Factory Defaults.** A <**Continue**> soft key will appear. Pressing this key will return the screen to the **MATE** menu.

4. After setting the parameters for each set point, press the TOP navigation key to return to the **Main Menu** screen.
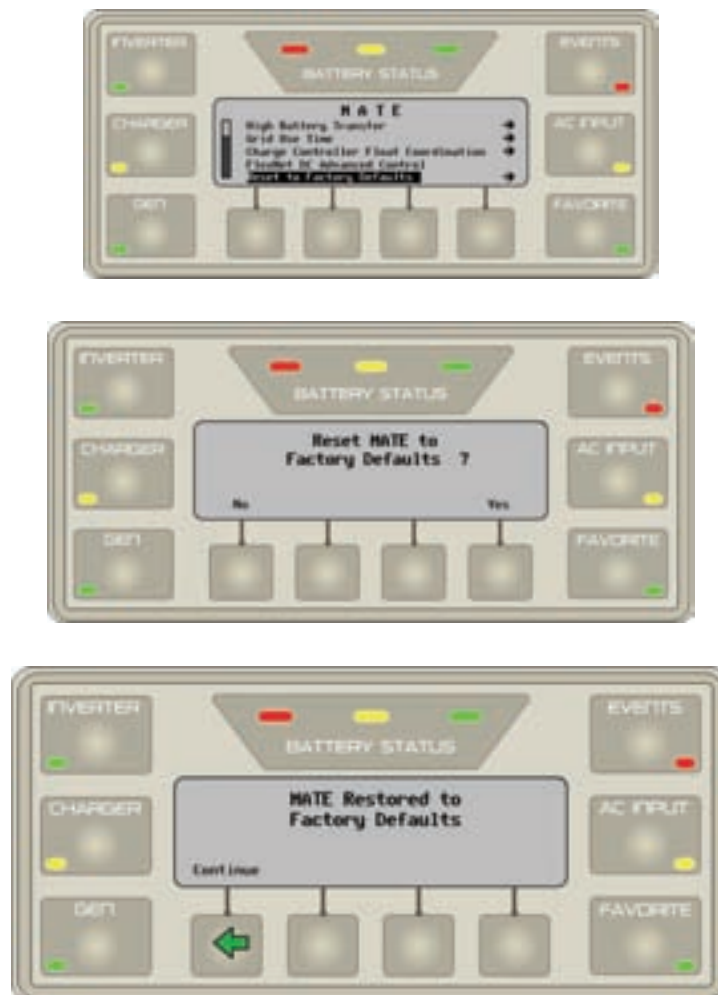

Figure 130   MATE Reset to Factory Defaults Screens

Configuration Wizard

This feature is not implemented at this time.

Data Logs

This feature is not implemented at this time.

Event Logs

This feature is not implemented at this time.

Software Update

The Software Update screen enables the MATE3 to download the latest software revision from an SD Memory Card (included). Contact OutBack Technical Support (see inside cover of this manual) for instructions on receiving the latest software revision.

To access the Software Update Screen:

1. Power up the MATE3 by connecting the Cat5 cable to the rest of the system.

2. Insert the SD Memory Card according to Figure 131.
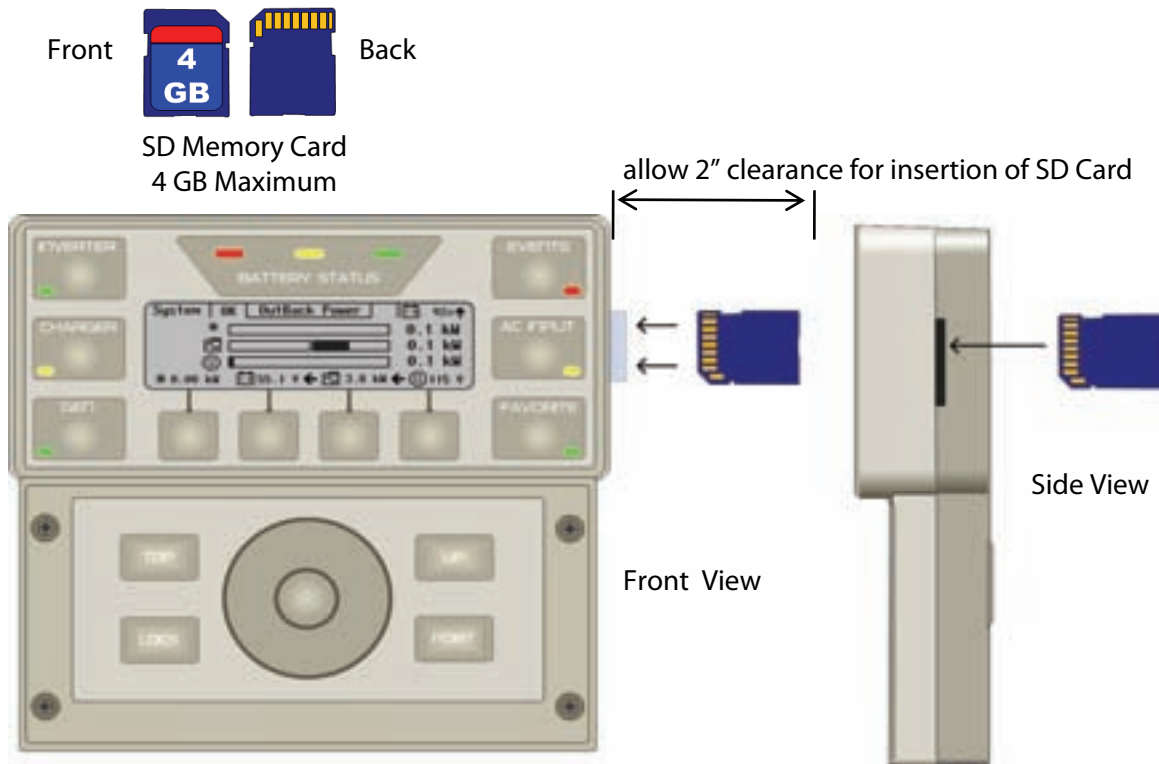
3. Access the Main Menu as shown on page 60.

Figure 131   SD Memory Card Slot

4. From the **Main Menu** screen, select **Software Update**.

5. From the **Software Update** screen, select **MATE**. The other items on the screen are not implemented at this time and are labeled "NA" for this reason.

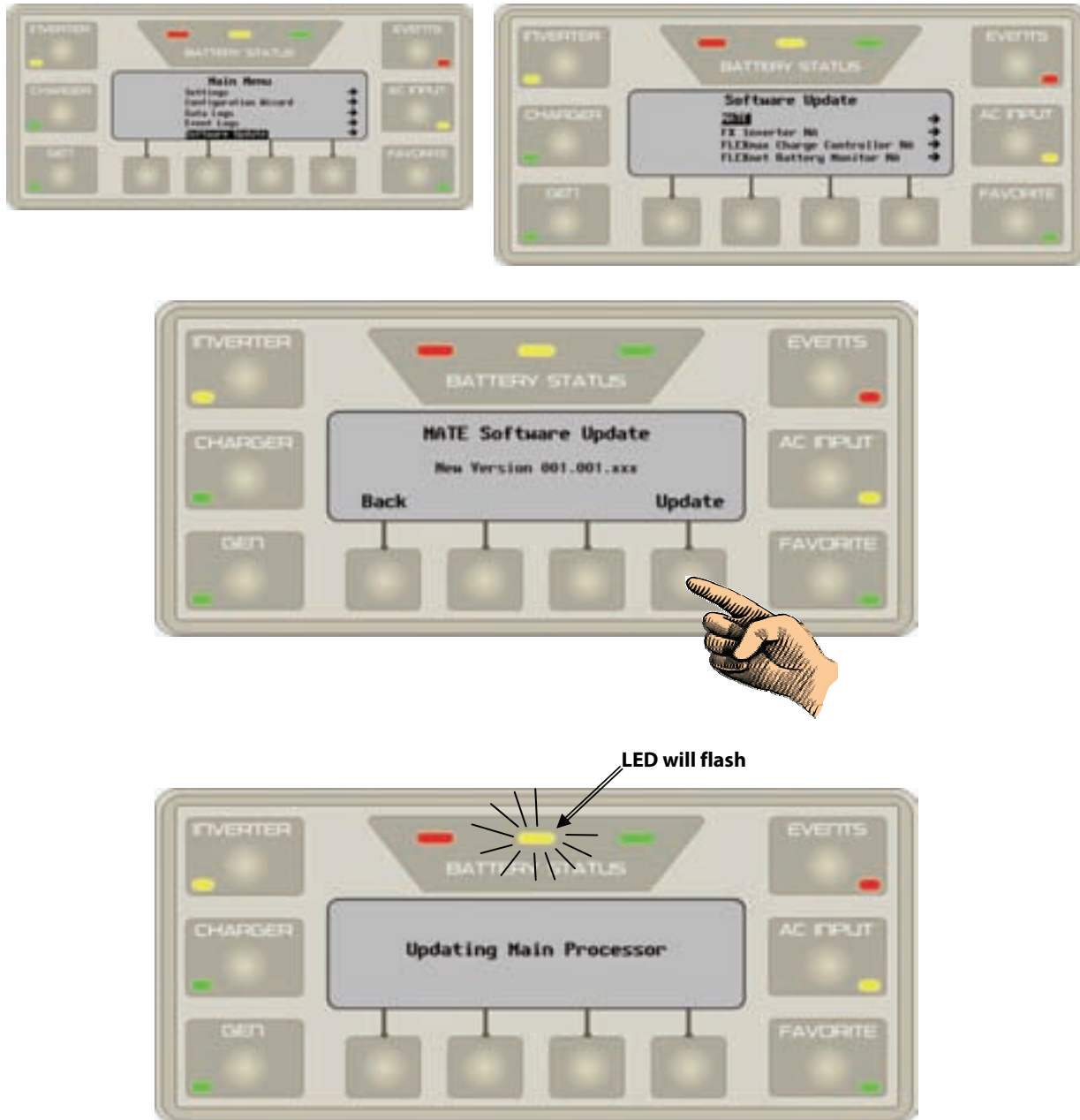6. From the **MATE Software Update** screen, press the key labeled **Update**.

Figure 132   MATE3 Software Update

7. The screen will show **Updating Main Processor**. The yellow battery LED will flash rapidly.

8. Once the update is complete, the MATE3 will automatically reboot itself and return to the Home screen. The software update is complete and the MATE3 can be reprogrammed as normal.

Troubleshooting

## Basic Troubleshooting of the MATE3

Table 3   Basic Troubleshooting

Symptom	Possible Cause	Remedy
MATE3 does not power up.	The MATE3 is powered by the OutBack product to which it is connected. Make sure that all OutBack products are powered-up and operating correctly before connecting the MATE3.	Check or replace the CAT5 cables running from the MATE3 to the OutBack product.
	The left-hand RJ45 port on the back of the MATE3 is used for computer communications. It cannot power a MATE3.	Make sure the CAT5 cable is plugged into the correct RJ45 port (the right-hand port).
HUB loses power when cable is plugged into MATE.	The left-hand RJ45 port on the back of the MATE3 is wired differently and may short out a HUB.	Make sure the CAT5 cable is plugged into the correct RJ45 port (the right-hand port).
MATE3 does not display a particular device, meter, or setting.	Make sure that all OutBack Products are powered-up and operating correctly before connecting the MATE3.	Check or replace the CAT5 cables running from the MATE3 to the OutBack product. If a HUB is being used, make sure no OutBack products have been moved, unplugged, or added.
Voltmeter for a particular device or screen is inaccurate.	Meter could be miscalibrated.	Confirm correct voltage with an accurate voltmeter. (Make all tests on the terminals of the OutBack product.) If necessary, adjust the product meter using the Calibration menus.

Event Messages

To investigate Event Messages:

1. Look at the System indicator. The icon will change to indicate the device that needs attention. See Legend in Figure 134.

2. Check the LED

   ~   Flashing means a warning type event has occurred.
   ~   Solid means an error has occurred.
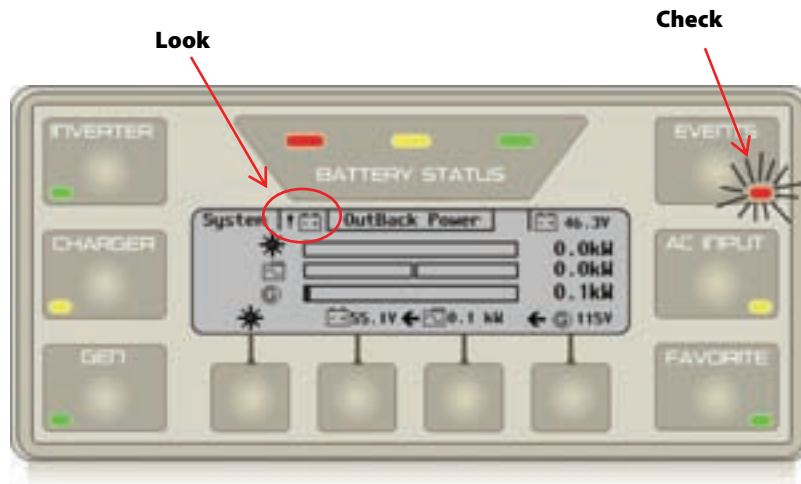
System Indicator Legend	
OK	System Operational
! 🔋	Check Battery (with FNDC only)
X 🔋	Battery Critical (with FNDC only)
! Ⓖ	Check Generator (Off Grid system type only)
! ∿	Check Inverter
! ⛉	Check Utility Grid (with grid-tie inverter only)

These system indicators are often specific to certain products or system configurations, as noted in the table. See pages 26 and 27 for details.

Figure 133   Event Notification

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3. Press the EVENTS key to display the **Event Status** Screen.

4. Navigate to the screen to be viewed. (Figure 134)

    ~ Press <**Next**> to view the next event in the list.
    ~ Press <**Prev**> to view the previous event in the list.
    ~ Press <**Back**> to return to the Home screen.

5. To view the detail about an event, press the <**Details**> soft key.

    ~ Press <**Back**> to return to the **Event Status** screen.
    ~ Press <**Back**> again to return to the Home screen.
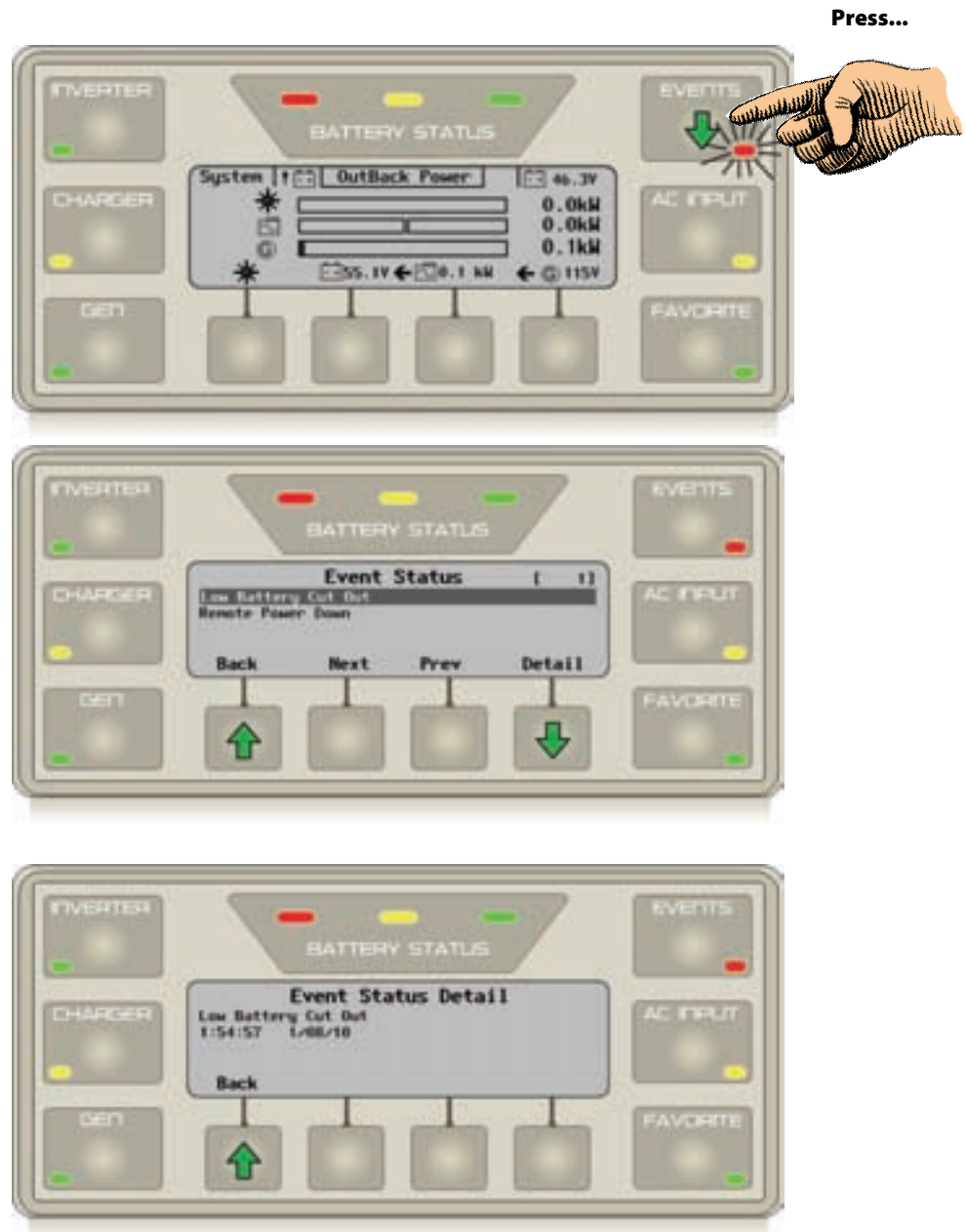

Figure 134   Reviewing Event Messages

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Specifications

Mechanical Specifications

Mechanical Specification	MATE3
Dimensions (H x W x D)	7 1/2" x 7 1/16" x 1 5/8"" (19 x 17.9 x 4.2 cm)
Shipping Dimensions (H x W x D)	3 ¼ x 9 x 13 ½" (33.7 x 22.9 x 34.3 cm)
Weight	1.4 lbs (0.64 kg)
Shipping Weight	3.0 lbs (1.36 kg)
Ports	Ethernet (x2)
Non-volatile Memory	None
Interface Display	Liquid Crystal Display (LCD)
Control Keypad	4 Soft Keys 6 Hot Keys 4 Navigation keys 1 Control Wheel with Enter Button
Status Indicators	9 LEDs
Communication Protocol	Proprietary OutBack network
Interconnection Cabling Standard	Category 5 OutBack Proprietary
PC Computer Interface	Category 5
Environmental Rating	Indoor only
Warranty Standard	5-year

NOTES:

Menu Map

Table 4   Menu Map (System Settings)

Menu	Menu Option	Menu Items	Set Points	Installer Settings	Page
Settings	*System*	*System Information*	*Name*		64
			Type		
			Nominal Voltage		
			Array Wattage		
			Battery amp-hours		
			Generator kW		
			Generator Type		
			Max Inverter kW		
			Max Charger kW		
		Date & Time	*Hour*		65
			Minutes		
			Day		
			Month		
			Year		
			Day of Week		
		LCD Display	*Contrast*		66
			Color		
			Brightness		
			Backlight		
			Auto Timeout		
		Sound	*Button Beep*		67
			Wheel Click		
		EtherNet Addresses	*DHCP*		68
			IP Address		
			Gateway		
			DNS-1		
			DNS-2		
		Ethernet Ports	*HTTP*		69
			FTP		
			Telnet		
		Data Stream	*Serial Data Stream*		70
			Serial Baud Rate		
			Network Data Stream		
			Destination IP		
			Destination Port		
		Installer Settings	*Set User Access Level*		71
			Change Installer Password		
			Challenge Installer Password		

<p align="center">**Table 5   Menu Map (Inverter Settings)**</p>

Menu	Menu Option	Menu Items	Set Points	Installer Settings	Page
System	*Inverter*	*Search*	*Sensitivity*		76
			Pulse Length		
			Pulse Spacing		
		AC Current Limit	*Input Type (Grid/Gen)*		77
			Grid Input AC Limit		
			Gen Input AC Limit		
			Charger AC Limit		
		Grid AC Voltage Limits	*Lower Voltage Limit*		79
			Upper Voltage Limit		
			Transfer Delay		
		Gen AC Voltage Limits	*Lower Voltage Limit*		80
			Upper Voltage Limit		
			Transfer Delay		
		AC Output	*Output Voltage*		81
		Low Battery	*Cut-Out Voltage*		82
			Cut-In Voltage		
		Battery Charger	*Absorb Voltage*		83
			(Absorb) Time		
			Float Voltage		
			(Float) Time		
			Re-Float Voltage		
		Battery Equalize	*Equalize Voltage*		84
			(Equalize) Time		
		Auxiliary Output	*Status*		85
			AUX Mode ➤ *Remote* ➤ *Load Shed* ➤ *Gen Alert* ➤ *Fault* ➤ *Vent Fan* ➤ *Cool Fan* ➤ *Divert DC* ➤ *Divert AC*		
			AC Drop		
		Inverter Stacking	*Stack Mode*		88
			Master Power Save Level		
			Slave Power Save Level		
		Grid-Tie Sell	*Grid-Tie Enable*		90
			Sell Voltage		
			Grid-Tie Window		
		Calibrate	*Input Voltage*		92
			Output Voltage		
			Battery Voltage		
		Reset to Factory Defaults	*No or Yes*		93

Table 6   Menu Map (Charge Controller Settings)

Menu	Menu Option	Menu Items	Set Points	Installer Settings	Page
System	*Charge Controller*	*Charger*	*Absorb Voltage*		95
			(Absorb) Time		
			Float Voltage		
			Rebulk Voltage		
			Current Limit		
			Absorb End Amps		
		MPPT	*MPPT Mode*		96
			U-Pick VOC		
			Wakeup VOC Change VDC		
			Wakeup VOC Change Time		
			Snooze Mode Amps		
			MPPT Range Minimum		
			MPPT Range Maximum		
		Temperature Compensation	*Mode (Wide/Limited)*		97
			Limited: Lower Battery Voltage		
			Limited: Upper Battery Voltage		
		Battery Equalize	*Equalization Voltage*		98
			Hours		
			Automatic Battery Equalization		
		Grid Tie Mode	*Y or N*		99
		Auxiliary Output	*Status*		85
			AUX Mode ➢ *Vent Fan* ➢ *PV Trigger* ➢ *Error Output* ➢ *Night Light* ➢ *Float* ➢ *Diversion:Relay* ➢ *Diversion: Solid St* ➢ *Low Batt Disconnect* ➢ *Remote*		
		Restart Mode	*0, 1, 2*		103
		Calibrate	*Battery Voltage*		104
		Reset to Factory Defaults	*Y or N*		105

Table 7   Menu Map (Battery Monitor Settings)

Menu	Menu Option	Menu Items	Set Points	Installer Settings	Page
System	*Battery Monitor*	*Battery Setup*	*Battery Amp-hours*		107
			Charge Voltage		
			Time		
			Minutes		
			Charged Return Amps		
			Charge Factor _____%		
		Shunt Enable	*Shunt A (Enable/Disable)*		108
			Shunt B (Enable/Disable)		
			Shunt C (Enable/Disable)		
		Relay Mode	*Status (ON or OFF)*		109
			Invert Logic (?)		
		Relay Set Points	*Voltage: High ___Vdc*		109
			Voltage: Low ___ Vdc		
			SOC: High ___%		
			SOC: Low ___%		
			Delay: High _____		
			Low: _____Minutes		
		Reset to Factory Defaults	*Y or N*		111

Table 8   Menu Map (MATE Settings)

Menu	Menu Option	Menu Items		Set Points	Installer Settings	Page
System	*MATE*	*AGS*	*Setup*	*AGS Enabled*		115
				Port		
				Fault Time		
				Warmup Time		
				Cool Down Time		
				DC Gen Set		
				Voltage Stop		
			Voltage Start	*24 Hr Start Enable*		118
				2 Hour Start Enable		
				2 Minute Start Enable		
			Load Start	*Enabled*		119
				Start		
				Stop		
			State-of-Charge Start	*Enabled*		120
				Start SOC ___%		
				Stop SOC ___%		
				Enable Full Change (Y/N)		
			Must Run Schedule	*Enable*		121
				Weekday Start		
				Weekday Stop		
				Weekend Start		
				Weekend Stop		

Table 8   Menu Map (MATE Settings)

Menu	Menu Option	Menu Items		Set Points	Installer Settings	Page
System	*MATE*	*AGS*	*Quiet Time Schedule*	*Enable*		122
				Weekday Start		
				Weekday Stop		
				Weekend Start		
				Weekend Stop		
			Generator Exercise Schedule	*Enable*		123
				Exerc ise Run on (Day)		
				Start Time (0:00)		
				Run Period (15 minutes)		
				Exercise Interval (2 weeks)		
				Disable Sell During Exercise (N/Y)		
			Display AGS Timers			124
		Data Logging				126
		High Battery Transfer		*Enable (Disabled)*		127
				Grid Connect ___ Vdc		
				Delay ___ min (Range?)		
				Grid Disconnect ___ VDC		
				Delay ___ min (Range?)		
				Grid Connect SOC ___%		
				Grid Disconnect SOC ___%		
		Grid Use Time		*Enable(Y or N)*		129
				Weekday Use		
				Weekday Drop		
				Weekend Use		
				Weekend Drop		
		Charge Controller Float Coordination		*Enable(Y or N)*		131
		FLEXnet DC Advanced Control		*Enable Charge Termination Control*		132
				Enable Auto Grid-Tie Control		
				Battery Status		
				Low SOC Warning Level		
				Critical SOC Warning Level		
		Reset to Factory Defaults		*Y or N*		133

Table 9   Menu Map (Misc)

Menu	Menu Option	Menu Items	Set Points	Installer Settings	Page
Configuration Wizard	TBD	TBD			
Data Logs	TBD	TBD			
Event Logs	TBD	TBD			
Software Update	TBD	TBD			

Product Registration

The purchase of an OutBack Power Technologies product is an important investment. Registering the products will help us maintain the standard of excellence you expect from us in terms of performance, quality and reliability.

Please take a moment to register and provide us with some important information.

SYSTEM OWNER	
Name	
Address	
City, State, Zip Code	
Country	
Telephone Number	
E-mail	
SYSTEM PURCHASE	
Product Model Number	
Product Serial Number	
Sold by	
Purchase Date	

Please check ALL factors affecting purchase decision:

- ❐ Grid-Interactive Capability
- ❐ Product Reputation
- ❐ Back-up Capability
- ❐ Reputation of OutBack Power Technologies
- ❐ Value
- ❐ Looks
- ❐ Other

INSTALLATION INFORMATION	
System Install/Commission Date	
System Array Size	
System Array Nominal Voltage	
Type of PV Modules	
System Battery Bank Size (Amp-Hours)	
Brand and Model of Batteries	
Does this system include an auxiliary AC generator?	
If yes, please specify brand and model of generator	
INSTALLER INFORMATION	
Contractor Number	
Installer Address	
Installer City, State, Zip	
Installer E-mail	

Remove this page from the manual and mail it to the following address. Be sure to keep a copy for your records.

OutBack Power Technologies
Attn: Warranty Registration
19009 62nd Avenue NE
Arlington, WA USA 98223

Warranty

5-Year Limited Warranty for the MATE3 System Display and Controller

OutBack Power Technologies, Inc. ("OutBack") provides a five-year (5) limited warranty ("Warranty") against defects in materials and workmanship for its MATE3 Display and Controller ("Product").

The term of this Warranty begins on the Product(s) date of manufacture or the initial purchase date as indicated on the warranty registration card submitted to OutBack, whichever is later. This Warranty applies to the original OutBack Product purchaser, and is transferable only if the Product remains installed in the original use location. The warranty does not apply to any Product or Product part that has been modified or damaged by the following:

> ➢ Installation or Removal;
> ➢ Alteration or Disassembly;
> ➢ Normal Wear and Tear;
> ➢ Accident or Abuse;
> ➢ Corrosion;
> ➢ Lightning;
> ➢ Repair or service provided by an unauthorized repair facility;
> ➢ Operation or installation contrary to manufacturer product instructions;
> ➢ Fire, Floods or Acts of God;
> ➢ Shipping or Transportation;
> ➢ Incidental or consequential damage caused by other components of the power system; or
> ➢ Any product whose serial number has been altered, defaced or removed.

OutBack's liability for any defective Product, or any Product part, shall be limited to the repair or replacement of the Product, at OutBack's discretion. OutBack does not warrant or guarantee workmanship performed by any person or firm installing its Products. This Warranty does not cover the costs of installation, removal, shipping (except as described below), or reinstallation of Products or parts of Products.

THIS LIMITED WARRANTY IS THE EXCLUSIVE WARRANTY APPLICABLE TO OUTBACK PRODUCTS. OUTBACK EXPRESSLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTIES OF ITS PRODUCTS, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. OUTBACK ALSO EXPRESSLY LIMITS ITS LIABILITY IN THE EVENT OF A PRODUCT DEFECT TO REPAIR OR REPLACEMENT IN ACCORDANCE WITH THE TERMS OF THIS LIMITED WARRANTY AND EXCLUDES ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR PRODUCTS NOT BEING AVAILABLE FOR USE OR LOST REVENUES OR PROFITS, EVEN IF IT IS MADE AWARE OF SUCH POTENTIAL DAMAGES. IF YOU ARE A CONSUMER THAT PURCHASED THIS PRODUCT IN A MEMBER STATE OF THE EUROPEAN UNION, YOU MAY HAVE ADDITIONAL STATUTORY RIGHTS UNDER DIRECTIVE 1999/44/EC. THESE RIGHTS MAY VARY FROM EU MEMBER STATE TO EU MEMBER STATE. SOME STATES (OR JURISDICTIONS) MAY NOT ALLOW THE EXCLUSION OR LIMITATION OF WARRANTIES OR DAMAGES, SO THE ABOVE EXCLUSIONS OR LIMITATIONS MAY NOT APPLY TO YOU.

How to Arrange for Warranty Service

During the warranty period beginning on the invoice date, OutBack Power Technologies will repair or replace products covered under this limited warranty that are returned to OutBack Power Technologies' facility or to an OutBack Power Technologies authorized repair facility, or that are repaired on site by an OutBack Power Technologies authorized repair person.

IMPORTANT:

For full Warranty description, see previous page.

Contacting OutBack

To request warranty service, contact OutBack Technical Support at **+1.360.435.6030** or direct at **+1.360.618.4363** or **support@outbackpower.com**. To ensure warranty coverage, this contact must be within the effective warranty period. If service is required, the OutBack Technical Support representative will issue a Return Material Authorization (RMA) number.

Troubleshooting

In the event of a Product failure, the customer will need to work with an OutBack Technical Support representative to perform the necessary troubleshooting. This is a required step before a return can be performed. Troubleshooting requires a qualified technician to be present at the site of the Product, with a quality voltmeter that measures both DC and AC. The OutBack representative will request voltmeter readings, Product error messages, and other information. Many, many problems can be resolved on-site. If the customer is not willing or able to provide these readings (or is not willing or able to visit the site), and the Product is found to have no problems upon return, OutBack may choose to charge additional labor and handling fees up to $180.00 U.S.

Return Material Authorization (RMA)

A request for an RMA number requires all of the following information:

1. Product model and serial number;

2. Proof-of-purchase in the form of a copy of the original Product purchase invoice or receipt confirming the Product model number and serial number;

3. Description of the problem; and

4. Shipping address for the repaired or replacement equipment.

Upon receiving this information, the OutBack representative can issue an RMA number.

Returning Product to OutBack

After receiving the RMA number, the customer must pack the Product(s) authorized for return, along with a copy of the original purchase invoice and warranty certificate, *in the original Product shipping container(s) or packaging providing equivalent or reasonable protection*. The RMA number must be written on the outside of the packaging where it is clearly visible.

The Product(s) must be shipped back to OutBack Power Technologies in their original or equivalent packaging, to the following address:

<div align="center">

OutBack Power Technologies
RMA # _____
6115 192nd Street NE
Arlington, WA 98223 USA

</div>

The customer must insure the shipment, or accept the risk of loss or damage during shipment. If a shipping box is needed for return of a Product, OutBack will send a shipping box upon request.

	IMPORTANT: OutBack is not responsible for shipping damage caused by improperly packaged Products, the repairs this damage might require, or the costs of these repairs.

If, upon receipt of the Product, OutBack determines the Product or Product part is defective and that the defect is covered under the terms of this Warranty, OutBack will then, and only then, ship a repaired or replacement Product or Product part to the purchaser freight prepaid, non-expedited, using a carrier of OutBack's choice, where applicable.

If Product fails in ninety (90) or fewer days from original purchase date, OutBack will replace with a new Product. If Product fails after ninety (90) days and up to expiration of warranty, OutBack will, at its discretion, either repair and return a Product, or ship a replacement Product. OutBack will determine whether a Product is to be repaired or replaced in accordance with Product age and model. OutBack will authorize advance shipment of a replacement based on Product age and model.

In cases where an OutBack dealer or distributor replaces a Product more than ninety (90) days old with a new Product, OutBack will NOT compensate that dealer or distributor with new stock unless the exchange was authorized in advance by OutBack.

Out of Warranty

If Product is out of warranty, OutBack will repair and return Product for a fee. Alternately, if applicable, upon request, OutBack will advance-ship replacement parts for a fee.

If a shipping box is needed for return of out-of-warranty Product, OutBack will send a shipping box upon request. The customer is responsible for paying shipping to OutBack.

The warranty period of any repaired or replacement Product or Product part is ninety (90) days from the date of shipment from OutBack, or the remainder of the initial warranty term, whichever is greater.

This Warranty is void for any Product that has been modified by the customer without authorization by OutBack. A Product with a voided warranty will be treated the same as one with an expired warranty.

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