To upload firmware to the MATE3s:
1. Insert the SD card into the MATE3s (A).
2. In Main Menu under Firmware Update (B), select MATE3s (C). Press <Update> (D).
3. The screen will show updates for several minutes with the BATTERY STATUS yellow LED indicator flashing rapidly (E). Revision is complete when the home screen reappears.

CAUTION: EQUIPMENT DAMAGE
Do not disconnect the MATE3s or otherwise stop the upload before completion. Any interruption could permanently corrupt the MATE3s.

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

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Warranty Summary
OutBack Power Technologies warrants that the products it manufactures will be free from defects in materials and workmanship for a period of five (5) years subject to the conditions set forth in the warranty detail, found in the product manual.

OutBack Power Technologies cannot be responsible for system failure, damages, or injury resulting from improper installation of their products.

Notice of Copyright
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Date and Revision
March 2017, Revision A

NOTE: These instructions require knowledge of menu navigation in password-secured MATE3s menus. For information on MATE3s Programming Guide.

MATE3s System Display and Controller

Contents:
Installation…………………………...….. 1-2
LED Indicators….……………….....…… 3-5
Home Screens……..……….…..…….... 6-8
Soft Keys………………………….…..….. 9-14
Hard Keys…….……………..…….…….. 15-18
Firmware Updates…………...………... 19-20

Features
A: LCD display screen
B: Soft keys
C: Hot keys
D: SD card slot
E: Navigation keys
F: Mounting Holes
G: Ethernet port
H: HUB Communications Manager port

NOTE: This document assumes knowledge of features, functions, and operation of other OutBack products. Consult appropriate literature as necessary.

Mounting Brackets
Items 1, 2, and 3 are the MATE3s mounting options from OutBack.
1. FW-MB3 (FlexiScreen Mounting Bracket) mounts on an OutBack FlexiScreen assembly or on a Radian-class inverter.
2. FW-MB5 (Flat Mount Kit) mounts against a wall surface and an outlet box. The cables are recessed into the wall.
3. FW-MBS30 (Surface Mount Kit) mounts against a flat surface but does not require an opening in the wall.

Mounting Without Brackets
Item 4 is a semi-transparent front view which also shows the ports and other back features.
To mount the MATE3s on the wall without the accessory brackets:
1. Cut a hole in the surface at the location and size shown in 4. This allows room for the CAT5 cables to protrude through the wall.
2. Place the MATE3s on the wall with the cables inside the hole. Mark the mounting holes (F) by pushing a long nail into the mounting holes and putting a leader hole in the wall surface.
NOTE: Do not use a nail that is larger than the mounting screws.
Product Configurations (examples)

The MATE3s connects to other OutBack products using the HUB port. To learn what configurations are available, see the appropriate manual. To make MATE3s settings for a configuration, see the MATE3s Programming Guide.

Communications Interfacing (examples)

The MATE3s interfaces with other devices using the Ethernet port. The connections here are used for Internet access with the OPTICS RE interface. Other connections are possible. The MATE3s can connect using a network switch or a wireless network router.

Battery LED Indicators

Three LED indicators indicate the condition of the battery bank.  
- **GREEN** means the batteries have an adequate charge at that time. It does not always mean they are full. If the FLEXnet DC battery monitor (FN-DC) is installed, this means the batteries are 80% State of Charge (SOC).
- **YELLOW** means the batteries are somewhat discharged. If the FN-DC is installed, this means the battery SOC is between 60% and 70%.
- **RED** means the batteries are greatly discharged and may require attention. If the FN-DC is installed, this means the battery SOC is less than 60%. This indicator may be accompanied by a Low Battery V event and the **EVENTS** indicator. (See page 5.)

<table>
<thead>
<tr>
<th>Color</th>
<th>12 Vdc Unit</th>
<th>24 Vdc Unit</th>
<th>36 Vdc Unit</th>
<th>48 Vdc Unit</th>
<th>Battery Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>12.5 Vdc or higher</td>
<td>25.0 Vdc or higher</td>
<td>37.5 Vdc or higher</td>
<td>50.0 Vdc or higher</td>
<td>Acceptable</td>
</tr>
<tr>
<td>YELLOW</td>
<td>11.5 to 12.4 Vdc</td>
<td>23.0 to 24.8 Vdc</td>
<td>34.5 to 37.2 Vdc</td>
<td>46.0 to 49.6 Vdc</td>
<td>Usable</td>
</tr>
<tr>
<td>RED</td>
<td>11.4 Vdc or lower</td>
<td>22.8 Vdc or lower</td>
<td>34.2 Vdc or lower</td>
<td>45.6 Vdc or higher</td>
<td>Low</td>
</tr>
</tbody>
</table>

**NOTES:**
- Gaps in the table (higher-voltage units) are due to the resolution of the inverter’s DC meter.
- These voltage settings are not the same as the inverter’s Low Battery Cut-Out voltage. The Battery LED settings cannot be changed.
- Voltages higher than shown in the **GREEN** row usually means that the batteries are charging.

Displays

When the MATE3s is plugged into a powered OutBack product, it immediately powers up and cycles 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.
LED Indicators

**System LED Indicators**

The six System indicators show the status of different aspects of the system. In most cases, more information is available by pressing the "hot" key where the indicator is located. Pages 14 through 18 have more information on these hot keys.

- **INVERTER** indicator (green): This shows the status of the inverter (or the master inverter in a stacked system).
  - ON (solid): Powering the loads.
  - ON (flash): Search.
  - OFF: The inverter is not converting DC to AC.
- **CHARGER** indicator (yellow): This shows the status of any charger active in an OutBack system.
  - ON (solid): The batteries are being equalized.
  - OFF: No device is actively charging the batteries.
- **GEN** indicator (green): This shows the status of a generator that is controlled by the Advanced Generator Start (AGS) function.
  - ON (solid): The generator is running after an AGS command in the Generator Status menu. The generator is determined to be running based on input AC voltage (if the generator type is AC). This LED will illuminate in conjunction with the AC FYLIT LED indicator. It only illuminates when an AC generator is used.
  - OFF: 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 indicator will remain on until a generator fault is declared.

**EVENTS** indicator (red): An "event" is a change in status, externally imposed on a device (an on/off command, an automatic generator start, loss of grid power, etc.). The Event History screen logs all events for potential troubleshooting (see page 17). The LED indicator means that an event requires acknowledgement. Usually it only illuminates when a fault occurs.

- On (solid): An error has occurred. This is usually accompanied by inverter shutdown. This can also show a generator fault if the voltage is lost from an automatic generator.
- On (flash): A warning has occurred. It stops flashing if conditions return to normal.
- Off: No particular status. Events may be logged in Event History, but they do not require attention.

**FAVORITE** indicator (green): This 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 (flash): The hot key has been held down to program a Favorite.
- Off: No particular status. The indicator only illuminates upon pressing the hot key.

Home Screens

The Home screen appears after the MATE3s detects the devices connected to it. Home screens display different types of information depending on the system type selected. This is set in the **System Information** screen. (See the MATE3s Programming Guide.) Three **System Types** (and Home screens) are available:

- **Off Grid** is for when no utility grid is available. Often used with a generator. This is the default screen.
- **Backup** is for using the inverter system to back up the utility grid.
- **Grid Tied** is for grid-interactive inverters capable of returning power to the utility grid. Most commonly used with renewable energy systems.

**NOTE**: Selecting Grid Tied does not activate the grid-interactive function. It simply arranges the screen to display grid-interactive data most effectively. The function must be set in the inverter itself. FXR- and Radian-class inverters need to be placed in the AC input mode which is also called Grid Tied. GTXF and GVFX inverters have this function enabled by default.) See the applicable inverter literature.

**Meter Bars**

Much of the Home screen data is shown by kilowatt meters in the form of black bars next to the various icons. These meter bars expand to the right or to the left. Not all data is present in all cases. Each home screen uses a different combination of meter bars. The scale of each bar is described on page 7. The parameters for the bars are based on the data in **System Information**.

- The $ meter bar represents the charge controller output. If no charge controller is detected, this bar is not present.
- The left $ meter bar represents inverter output when **System Type** is set to Off Grid or Backup.
- The right $ meter bar represents the inverter’s charger output when **System Type** is set to Off Grid or Backup.
- The $ meter bar represents the generator output when **System Type** is set to Off Grid.
- The left $ meter bar represents the power bought from the grid when **System Type** is set to Grid Tied.
- The right $ meter bar represents the amount of power sold by the inverter when **System Type** is set to Grid Tied.
- The $ meter bar represents the amount of power used by the output loads when **System Type** is set to Grid Tied or Backup.

For a legend of the screen symbols, see page 6.
**Basic Navigation**

**Soft Keys**

Four “soft” keys are located directly below the display. Soft key functions vary depending on the location. These functions are identified by icons or text directly above the key. Occasionally not all four soft keys are used.

- **Off Grid or Backup system types:** “OK” is replaced with ![Battery icon](image) (with an event message) during a grid fault.
- **Grid Tied system type:** “OK” is replaced with ![Battery icon](image) (with an event message) during a grid fault.
- In any system type:
  - “OK” is replaced with ![Battery icon](image) or ![Battery icon](image) (with an event message) if the FLEXnet DC is present and registers a battery problem.
  - “OK” is replaced with ![Battery icon](image) (with an event message) during an inverter fault.

**In the Backup system type,** the **System Information** menu must have an AC generator selected. Otherwise this field is blank. (See the MATE3s Programming Guide.)

If **Gen Type** is set to DC, then the left meter bar is scaled according to the **Max Inverter kW** setting.

---

**Home Screen Legend**

**Soft Keys**

In **Off Grid** or **Backup** system types:
- **OK** is replaced with ![Battery icon](image) (with an event message) during a grid fault.
- In **Grid Tied** system type: “OK” is replaced with ![Battery icon](image) (with an event message) during a grid fault.
- In any system type:
  - “OK” is replaced with ![Battery icon](image) or ![Battery icon](image) (with an event message) if the FLEXnet DC is present and registers a battery problem.
  - “OK” is replaced with ![Battery icon](image) (with an event message) during an inverter fault.

**In the Backup system type,** the **System Information** menu must have an AC generator selected. Otherwise this field is blank. (See the MATE3s Programming Guide.)

If **Gen Type** is set to DC, then the left meter bar is scaled according to the **Max Inverter kW** setting.
Soft Keys: Inverter

Input Select, Input Priority, and Grid Status Soft Keys

- The Input Select screen (A1) allows two AC sources of different sizes when switched externally to a single input. (FX-class and FXR-class)
- The Input Priority screen (A2) selects which of two AC sources is accepted if both are active at the same time. It also shows the present source. (Radian-class)

Screen Items (A1 and A2):
- AC Input – Gen or Grid
- Input Current Limit – x.x x to x.x x Aac (varies with inverter model)
- In screen A1, the <Input> soft key (D) selects between the utility grid or a generator. Each selection has a pre-set value for the Input Current Limit.
- In screen A2, the <Input> soft key (E) chooses either the utility grid or the generator to take priority. Each selection has a pre-set value for the Input Current Limit.
- The <Less> or <More> soft keys (B and C) adjust these values in either screen.

Screen Items (some items apply only to A or B as indicated):
- The upper left corner of the screen shows the present mode of operation (Inverting, Charging, or other modes).
- In RMS: the power factor and input current of the AC source.
- Invert (A) or Charge (B): the kilowatts and AC current produced for loads, offsetting, or (when grid-interactive) sold back to the utility grid.
- Charge displays the kilowatts and AC current used to charge the battery bank. This line also shows the charge mode.
- Load: the kilowatts and AC current used by devices on the inverter’s output. This may or may not be the same as Invert.
- Buy (A): the kilowatts and AC current brought into the inverter’s input for both charging and loads. This is usually a total of the Charge and Load items and may equal In RMS.
- Gen (B): replaces Buy if the AC input mode is Generator or Support. The readings are the same. (FXR-and Radian-class only)
- Battery: the battery voltage. This reading is not compensated for temperature.
- AC Out and AC In: the AC voltage measured at the inverter’s output and input. If an AC source is present, these readings are generally the same. However, they may not be identical due to meter tolerances. (In Radian-class inverters, each item is the sum of the L1 and L2 readings.)
- AUX: the status of the inverter’s Auxiliary 12-volt output.
- Relay (B): the status of the inverter’s Auxiliary relay contacts. (Radian-class only)

Inverter Soft Key

- The <Next> soft key (C) displays a series of screens with information on the inverter’s charger and other battery-related functions, and on any inverter warnings or errors present. (See the next page.)
- The <Graph> soft key (D) displays a series of screens that plot various data over time. The graphs include inverter and charger wattage, power imported from an AC source, battery voltage, and others. The inverter wattage screen is shown here.
- The <Grid Status> soft key (A3) brings up AC input data. If the inverter is not in the Grid Tied input mode or connected to the utility grid, not all items will function.
- Screen Items (A3):
  - Grid: the present AC voltage from the source (the utility grid).
  - Min and Max: the lowest and highest daily AC voltage and the time each was recorded.
  - Mode: the inverter’s present operating status (either buying or selling) and the number of kilowatts begin bought or sold. This is blank if an AC source is not present.
  - The <Sell Status> soft key (F) brings up possible reasons for not selling to the utility grid.
  - The <Input Select> soft key (G) returns to screens A1 (FXR-class inverters) or A2 (Radian-class inverters). It is not present in FX-class inverters.

Inverter Modes:

This section shows all possible modes. Some may not be available with all OutBack inverters. Incompatible or unavailable modes will not be displayed. See the inverter literature to determine which functions are available and their definitions.
- Inverting (A)
- Selling (B)
- Charge (C)
- Offsetting (D)
- Error (E)
- Off (F)

NOTES: Charger Off and Silent are not used in FXR models. If the inverter is a master or subphase master in Silent mode with AC input, the mode appears as PassThru. If an FXRX inverter is used as a stacked slave, its only modes are Slave On, Slave Off, Error, Inverting, and Off.
- Slave On: The slave inverter is assisting the master’s activity (Sell, Charging, etc.).
- Slave Off: The slave inverter is not assisting or performing any active input. Slave Off is also used if the master status is PassThru. Master and slave inverters may both be transferring (passing power through).
- Slave On and Slave Off only appear when the AC input is in use. When no AC input is in use:
  - If the master is inverting, the slave also displays inverting while assisting with the inverting function.
  - If the slave is not actively assisting, it will display Off (not Slave Off).
**Inverter Soft Key (continued)**

**NOTES:** There are several other variations on C, the <Inverter> soft key screen.

A diode symbol may be present to show "diode charging", a low-power mode that allows fine control of charging, selling, and load support.

- In North American Radian-class inverters, inverter is split into L1 Phase and L2 Phase screens (reached using the <Next> soft key F). The screens are almost identical, but the AC voltage readings are the individual L1 and L2 phases.
- From these screens, the <Next> soft key (F) brings up the Inverter Battery screen.

**Screen Items (F):**

- **Actual:** The battery voltage. This reading is not compensated for temperature. See below.
- **Equalize:** The inverter’s Equalization voltage setting. It is used during the equalization cycle.
- **Temp Comp:** The battery voltage after compensation from the Remote Temperature Sensor (RTS). If no RTS is present, Temp Comp and Actual will read the same.
- **Batt Temp:** The battery temperature in degrees Celsius as measured by the RTS. If the RTS is measuring on an incorrect port, it will be displayed. See the literature for the inverter, charge controller, or other product to determine the correct port.
- **Re-Float:** The inverter’s Re-Float setting. It is used to return the charger from Silent mode to the float stage.
- **Offset:** The inverter’s voltage used during Offset activities, including selling. This item is labeled Self RE in older systems.

**NOTE:** If an arrow (J) appears next to **Absorb** 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.

**Warnings (G):**

- The **Warn** soft key (G) displays a series of screens with a list of non-critical faults and other information. When an inverter suffers a warning, one or more items in G will change from N to Y.

A warning is also accompanied by an event message and the red **EVENTS** indicator (see pages 5 and 17). 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 (G) which may appear:**

- **AC Freq Too High or Too Low:** The AC source is above or below the acceptable frequency limit.
- **Voltage Too High or Too Low:** The AC source is above or below the acceptable voltage limit.
- **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 also indicated by an unusual reading on the **Inverter Temps** screen (K). It may be called Temperature Sensor Fault.
- **Comm Fault:** See the entry under Errors. It only appears on this screen in older models. It may be called Comm Error.
- **Phase Loss:** A stacked inverter was ordered to transfer to an AC input source, but the source is the wrong phase or does not appear on the input.
- **Fan Failure:** The internal cooling fan is not operating properly. Lack of cooling may derate the inverter’s output wattage.

**Errors:**

- The **Error** soft key (H) displays a screen with a list of critical faults. When an error occurs, the inverter will usually shut down. One or more screen items will change from N to Y. An error is also accompanied by an event message and the red **EVENTS** indicator (see pages 5 and 17). See the inverter Operator’s Manual to troubleshoot a specific error.

**Screen Items (H) which may appear:**

- **Low Output Voltage:** Inverter AC regulation cannot be maintained under load.
- **AC Output Shorted:** Inverter maximum surge current was exceeded due to severe overload.
- **AC Output Backfeed:** Another AC power source (out of phase with the inverter) was connected to the AC output.
- **Stacking Error:** A programming problem among stacked units. (This often occurs if no master was assigned.)
- **Low Battery V:** DC voltage is below the Low Battery Cut-Out (LBCO) point. (See the **Operator’s Manual**.)
- **High Battery V:** DC voltage is above the inverter’s maximum allowed level.
- **Over Temperature:** Maximum operating temperature was exceeded.
- **Comm Fault:** Inverter suffered an internal communication failure and may need service.
- **Phase Loss:** See the entry under Warnings. It only appears on this screen in older models.

**NOTE:** The <Next> soft key (M) appears in FXR and Radian (A and E model) inverters with additional items.

**Screen Items (M) which may appear:**

- **Loose DC Neg Terminals:** Loose DC connection on internal power module. May read Loose DC Neg Terminals (L) or (R).
- **Battery Voltage Sense:** Internal sensing has detected voltages that are grossly outside the normal range.
- **AC Relay Fault:** AC transfer relay damaged.

**Temperatures:**

- The **Temp** soft key (K) displays the **Inverter Temps** screen. The internal temperature sensor readings are shown in degrees Celsius. The sensors are located on the main transformer, the heat sink for the Field Effect Transistors (FETs), and the filter capacitors. Normally all three read approximately the same. An unusual reading can indicate a defective sensor.

- **K1** shows these three readings for FX-class and FXR-class inverters. Radian inverters have twin (right and left) power modules. Each module has independent sensors and three separate readings.

- The **GT** soft key (L) displays the **GT Warnings** screen. It shows reasons why the inverter might stop selling power. If any reasons are valid, one or more items will change from N to Y. It is only available in Radian-class and FXR-class inverters in Input mode. It is not visible in FX-class inverters. The screen may be called **IEEE Warnings**.

**NOTE:** The **GT Warnings** have the same names as the Disconnect messages shown on page 18, but they are not the same. **GT Warnings** have to do specifically with selling (or not selling) power, while the Disconnect messages are general reasons for disconnecting from any source.
If the FLEXnet DC (FN-DC) battery monitor is not present, the <Battery> soft key (A) opens screen A2.

**Screen Items (A2):**
- **Bat:** The measured battery voltage. This reading is not compensated for temperature.
- **Min and Max:** The lowest and highest recorded voltages that day. These lines also show the time the voltages were recorded.
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

If the FLEXnet DC (FN-DC) battery monitor is present, the <Battery> soft key (A) opens screen A1.

**Screen Items (A1):**
- **Bat:** The net total current and kilowatts sent to or from the batteries. It also shows the net total amps and kilowatt-hours collected or taken from the batteries that day.
- **Last Line:** Shows both the highest and lowest recorded battery voltage SOC for that day, and the time each was recorded.
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

If the FN-DC is installed, the screen A1 opens screen A2.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (A):**
- **<Graph>** soft key (C) brings up a single graph showing changes in battery voltage over time. This graph may be used by other soft keys.
- **<Next>** soft key (D) brings up a Graph screen with changes in battery SOC over time (not shown). D and the following screens are only accessible from screen A1.
- **<Next>** brings up Graph screens for shunts A, B, and C (if present).

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (B):**
- **Bat:** The battery voltage, net current flow (positive or negative), battery temperature, and daily net amp-hour accumulation.
- **Min and Max:** The lowest and highest recorded battery voltage and SOC for that day and the time each was recorded.
- **Days SinceParmsMet:** The elapsed time since the “fully charged” parameters were met.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (C):**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (D):**
- **Net:** The number of amp-hours and kilowatt-hours brought into or removed from the batteries that day.
- **Input and Output:** The number of amp-hours and kilowatt-hours that have ever been drained from the batteries.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (E):**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (F):**
- **A, B, and C:** These display individual readings from up to three shunts (shunts A, B, and C). Each line shows the current and kilowatts measured at that time. It also shows the amp-hours and kilowatt-hours accumulated that day.
- **<Previous Day>** soft key (J) opens the Shunt A Historical Data screen to display long-term statistics. Soft keys for <Shunt B> and <Shunt C> are also present. If a shunt is not enabled, its statistics will read 0.
- **<Next Day>** soft key (K) opens the Historical Data screen for the next shunt in alphabetical order (not shown).
- **<Historical Data>** soft key (L) opens the Historical Data screen for the selected shunt.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.

**Screen Items (G):**
- **Minimum SOC:** The lowest SOC for that day.
- **Input and Output:** The number of amp-hours and kilowatt-hours brought into or removed from the batteries that day.
- **Net:** The net gain or loss in amp-hours or kilowatt-hours that day. This is the difference between the Input and Output fields.
- **Total Days at 100%:** The time since the batteries reached 100% SOC (according to the FLEXnet DC). If the batteries have not reached 100%, this will read 0. The time at 100% SOC is a running total which continues to accumulate until reset by the user.
- **Days SinceParmsMet:** The elapsed time since the “fully charged” parameters were met.
- **Reset kAH:** Soft key (M) resets this total.
- **Lifetime kAH:** Shows an accumulation of the total amp-hours that have ever been drained from the batteries.
- **Daily Net kAH:** Shows a new accumulation of the total amp-hours that have ever been drained from the batteries.
- **<Historical Data>** soft key (N) opens the Historical Data screen for the selected shunt.
- **<Reset kAH>** soft key (O) resets this total.

**Screen Items:**
- **AUX:** The current status of the battery monitor’s Auxiliary relay (also known as AUX mode or Relay mode). See the MATE3s Programming Guide.
**Soft Keys: Charge Controller**

The **<Charge Controller>** soft key (A) brings up FLEXmax charge controller status data. If no charge controller is present, the PV icon is blank and this soft key is inactive. The reading above this key shows the PV kilowatts used to charge the battery.

**Screen Items (A):**
- The upper left corner of the screen shows the present mode of operation *(Bulk, Absorb, Float, EQ, or Silent).*
- In: The present PV array operating voltage and the current harvested from the array.
- VOC: The available PV open-circuit voltage.
- Out: The present battery voltage and the controller’s battery charging current. This line also displays the daily accumulated kilowatt-hours and amp-hours.
- Operating: The total hours the charger has operated that day in any stage.
- Float and Absorb: The run time of the timers when in each stage.
- Maximum: The maximum daily PV current and wattage and the recorded times.
- The lower right corner shows the current status of the battery controller’s Auxiliary (AUX) output. (See the MATE3s Programming Guide and the charger controller manual.)

The **<DataLog>** soft key (B) brings up the **Charge Controller Datalog** screen. It maintains a continuous daily log (up to 126 days) of amp-hour and watt-hour statistics, as well as maximum current, wattage, and minimum and maximum voltage figures. One day can be displayed at a time.

**Screen Items (B):**
- Max Output: The maximum daily current and wattage.
- Absorb and Float: The amount either of these timers ran that day.
- High VOC: The highest daily open-circuit voltage (VOC).
- Min Batt and Max Batt: The lowest and highest daily battery voltage.
- The upper left corner shows the date of the selected **DataLog**. (The present **DataLog** screen reads Today.)
- The **<Day>** soft key (D) brings up the previous day’s log. Instead of Today, a date is shown.
- Similarly, the **<+Day>** soft key (E) advances the log by one day. (If Today is displayed, it does nothing.) This line also displays the daily accumulated kilowatt-hours and amp-hours.

The **<Graph>** soft key (C) brings up screens that plot different kinds of charge controller information. Shown here is the first **Graph** screen. This screen shows changes in PV wattage over time.

- The **<Next>** soft key (G) brings up a **Graph** screen (not shown) with changes in battery voltage over time. This graph may be used by other soft keys as well.
- Continuing to press **<Next>** brings up a **Graph** screen with changes in PV wattage over time.

**Screen Items (C):**
- **Battery:** The measured battery voltage, not compensated for temperature.
- **Input:** The AC source voltage and the power in kilowatts from the source.
- **Output:** The voltage measured at the inverter’s output and the kilowatts produced. The produced power may equal the load wattage, but can also include power sold to the grid.
- **Load:** Displays the kilowatts delivered to the inverter’s output.

The **<Graph>** soft key (D) brings up a **Graph** screen with changes in **PV voltage over time.**

**Screen Items (D):**
- Batt and Batt: The lowest and highest daily battery voltage.
- The upper left corner shows the date of the selected **Graph** screen. (Today.)
- Similarly, the **<Day>** soft key (E) brings up the previous day’s graph. Instead of Today, a date is shown.
- Similarly, the **<+Day>** soft key (F) advances the graph by one day. (If Today is displayed, it does nothing.) This line also displays the daily accumulated kilowatt-hours and amp-hours.

**Screen Items (E):**
- **AC In:** The input source voltage. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means the inverter is exporting (selling) power to the AC input. This only occurs in grid-interactive applications (with the inverter’s Grid Tied mode). A To kilowatt-hour reading is the daily energy sold by the system. A kilowatt reading under From means the inverter system is importing (buying) AC power from the source, either for charging or for loads. A From kilowatt-hour reading is the daily energy imported by the system.
- **AC Out:** The voltage measured at the inverter’s output. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means power is delivered to the AC output for loads. This may be inverted power (as shown under Batt) if no AC source is present. If a AC source is present, it may mean either offset power (see Batt) or power imported from the AC source (see AC In). A To kilowatt-hour reading is the daily energy delivered by the system. A kilowatt or kilowatt-hour reading under From is power received from the AC loads. This only occurs in AC Coupling applications.
- **Batt:** The measured battery voltage, not compensated for temperature. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means the inverter is delivering power to charge the batteries. This is imported power from the AC source (see AC In). A To kilowatt-hour reading is the daily charging energy delivered by the system. A kilowatt or kilowatt-hour reading under From is power delivered to the AC loads. This only occurs in AC Coupling applications.
- **AC In:** The input source voltage. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means the inverter is delivering power to charge the batteries. This is imported power from the AC source (see AC In). A To kilowatt-hour reading is the daily charging energy delivered by the system. A kilowatt or kilowatt-hour reading under From is power received from the AC loads. This only occurs in AC Coupling applications.

**Hot Keys**

Six “hot” keys display the most common operational screens. Some screens have selectable modes (On, Off, etc.) while some show function status. Some screens have their own soft keys and menus. The measurements and status messages are collective readings for the system, not for an individual inverter, unless specified otherwise. Similarly, commands are usually global unless specified otherwise.

**INVERTER**

The **INVERTER** hot key (A) brings up Inverter Status, with mode commands and readings. In a stacked system, the mode commands are global. Kilowatt readings are a total of all inverter measurements. Kilowatt-hour readings are daily accumulations which are reset to zero at midnight. All voltage readings are taken from the master inverter.

In Radian-class or FX-class models, **INVERTER** brings up screen A1. In FXR-class models, **INVERTER** brings up screen A2.

- The **<On>** and **<Off>** soft keys (B or C) send On or Off commands to all inverters.
The **<Search>** soft key (D) toggles in or out of Search mode.

**Screen Items (A1):**
- **Battery:** The measured battery voltage, not compensated for temperature.
- **Input:** The AC source voltage and the power in kilowatts from the source.
- **Output:** The voltage measured at the inverter’s output and the kilowatts produced. The produced power may equal the load wattage, but can also include power sold to the grid.
- **Load:** Displays the kilowatts delivered to the inverter’s output.

**Screen Items (A2):**
- **AC In:** The input source voltage. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means the inverter is exporting (selling) power to the AC input. This only occurs in grid-interactive applications (with the inverter’s Grid Tied mode). A To kilowatt-hour reading is the daily energy sold by the system. A kilowatt reading under From means the inverter system is importing (buying) AC power from the source, either for charging or for loads. A From kilowatt-hour reading is the daily energy imported by the system.
- **AC Out:** The voltage measured at the inverter’s output. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means power is delivered to the AC output for loads. This may be inverted power (as shown under Batt) if no AC source is present. If a AC source is present, it may mean either offset power (see Batt) or power imported from the AC source (see AC In). A To kilowatt-hour reading is the daily energy delivered by the system. A kilowatt or kilowatt-hour reading under From is power received from the AC loads. This only occurs in AC Coupling applications.
- **Batt:** The measured battery voltage, not compensated for temperature. This line also displays kilowatt and kilowatt-hour readings.
- A kilowatt reading under To means the inverter is delivering power to charge the batteries. This is imported power from the AC source (see AC In). A To kilowatt-hour reading is the daily charging energy delivered by the system. A kilowatt or kilowatt-hour reading under From is power delivered to the AC loads. This only occurs in AC Coupling applications.
The **CHARGER** hot key (**A**) brings up **Charger Status**, with readings and mode commands for charger(s) and equalization.

**NOTE:** This data is for inverter/chargers only. In a stacked system, it shows the master inverter status. If another inverter or a charge controller has a different status, it will not be displayed.

**Screen Items (A):**
- **Battery:** The measured battery voltage, not compensated for temperature.
- **Charger Control:** The charger mode setting.
- **Absorb:** The target voltage for the Bulk and Absorption stages.
- **Float:** The target voltage for the Float stage.
- The **Bulk Charge** soft key (**B**) brings up the Bulk Charge screen. A charge cycle can be started or stopped.
- The **EC Charge** soft key (**C**) brings up the EC Charge screen for equalization.
- The **Charger Mode** soft key (**D**) brings up the Charger Mode screen.

**Screen Items (B):**
- **The Start Bulk:** soft key (**E**) starts a new charging cycle, Bulk Charge Started is displayed.
- **The Stop Bulk:** soft key (**F**) halts a cycle, Bulk Charge Stopped is displayed.

**Screen Items (C):**
- **Battery:** The actual battery voltage, not compensated for temperature.
- **Equalize:** One reading shows the status of this mode. The other is the target voltage for equalization. The timer runs out when this voltage is reached.
- **Last EC charge:** The date and time for the latest cycle.
- **Check Battery Water Level Before Starting:** is not a changeable menu item. The text is offered as advice for equalization.
- **The Start ECQ** and **Stop ECQ** soft keys (**G** and **H**) control the equalization cycle.
- **G** leads to additional text. It needs to be confirmed (soft screen not changed) to avoid accidental equalization. Pressing the **<Esc>** key on that screen starts the process and returns the screen to State. Equalization proceeds automatically and stops at the end of the process.
- **The Stop ECQ** soft key (**H**) can stop equalization manually.

**Screen Items (D):**
- The **On** soft key (**J**) activates the charger to conduct a charge according to its settings.
  - **FXR** and **Radian**-class chargers use ABC (Advanced Battery Charging).
  - **FX**-class chargers use a standard three-stage cycle (bulk, absorption, and float).
- Afterward the charger remains in the float stage.
- In grid-interactive FX models, **On** is automatically selected when Input Select is set to Gen (see page 8). **On** cannot be selected if Input Select is set to Grid. **On** can still be selected.
- A **soft key (K)** disables the charger regardless of settings or operation. It will not function until J or L is pressed.
- The charger will operate even when set to **Off** if AGS is enabled. See the MATE3 Programming Guide.
- The **Auto** soft key (**L**) activates a three-stage cycle. Upon completion, the charger cycles between float stage and Silent mode. This key is only present in FX-class chargers. It is not present in FX-class or Radian-class models.
  - In grid-interactive FX chargers, **Auto** is automatically selected when the input Select menu is set to Grid (see page 8).
  - **Auto** cannot be selected if the menu is set to Gen. **On** can still be selected.
  - In FX-class and Radian-class chargers, this key is not present. The ABC settings choose the Silent or float stages.

The **GEN** hot key (**M**) brings up **Generator Status**, with readings and start/stop commands for the Advanced Generator Start (AGS) mode.

**Screen Items (M1 and M2):**
- The **On** and **Of** soft keys (**O** and **P**) manually start and stop the generator.
- The **Auto** soft key (**N**) allows the generator to start with automatic parameters set by the user in the AGS menu.
- The figure to the left of the Generator Status site displays accumulated generator run time. This counter can be reset.
- **Mode:** The selection mode allows **Auto, Off, On** using soft keys **N, O, and P**. It resets AGS DISABLED if AGS is turned off.
- **Status:** The current status of AGS. 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:** The reason of the last generator start, The date and time of the last start appears to the right of the reason. See the MATE3 Programming Guide to program, change, or reset AGS items.

The document also has a list of generator start and stop reasons.

When **On** is pressed, generator data appears on the right side of the screen (**M2**).

- The first line displays the generator's AC voltage and the generator Kilowatts used.
- The second line displays the updated status **RUN**, the time since the start command was sent, the battery state of charge (SOC) and the battery voltage. (If the FN-DC battery monitor is not present, the SOC field will be blank.)
- The third line displays the status of the battery charging cycles.

**NOTE:** The generator can only be started if the AGS mode is enabled in AGS Setup (see the MATE3 Programming Guide). If it is not enabled, this information will not appear.

The **EVENTS** hot key (**Q**) brings up **Event History**. (See page 5 for the definition of an event.) This screen can scroll through each event and display the details to determine if corrective action is required. An event may need acknowledgment before the **EVENTS** LED indicator will turn off.

Event logs can be saved to an SD card. See the MATE3s Programming Guide for instructions on saving event logs. The document also has more information on troubleshooting event messages.

**Screen Items (Q):**
- **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.
- The **Next** and **Prev** soft keys (**R** and **S**) highlight the next and previous events in the list. The control wheel will also scroll up and down this list.
- The **Details** soft key (**T**) brings up the **Event History Detail** screen.
- The **Event History Detail** screen (**T**) displays the details of the selected event, and prompts for acknowledgement, if necessary. Using the control wheel will display the detail for the previous, or the next, event as listed in the Event History screen.

**Screen Items (T):**
- **If the **Ack** and **Ack All** soft keys (**U** and **V**) appear, either must be pressed to acknowledge the event. Once acknowledged, the EVENTS indicator will turn off. An acknowledgement **(ACKED)** will replace the word Fault in the Event History screen.
- The **Ack** soft key (**U**) acknowledges a single open event.
- The **Ack All** soft key (**V**) acknowledges all open events.
**Firmware Updates**

The MATE3s can be updated to the latest revision by installing the latest firmware. Firmware can be ordered on a preloaded SD card, or downloaded from www.outbackpower.com. The firmware is available for download on the MATE3s product page or the Firmware page shown below. The page in this image is accessed using the Support tab (A).

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**Hot Keys: AC INPUT & FAVORITE**

**AC INPUT**

The AC INPUT hot key (A) brings up AC Input Status, with information on the AC source. It also has commands that can connect or disconnect from the source.

**Screen Items (A):**

- **AC Input Select** (Radian-class only): This displays which of two inputs was set as first priority for the inverter. (See the MATE3s Programming Guide to make this selection.) This item is not present in FX-class or FXR-class inverters.
- The top line also displays the present AC voltage and frequency from the input source.
- **Input Mode:** Allows soft key options to change the mode. This may be overridden by other commands. For example, a system set to Drop will automatically switch to Use if AGS starts the generator.
- **Input Voltage**: Displays the input voltage, with the sum of the L1 and L2 phases. (If present.)
- **Input Frequency**: Displays the input frequency, with the sum of the L1 and L2 phases. (If present.)
- **HBX-SOC Info:** Displays the current status of the HBX-SOC. This item is not present in FX-class or FXR-class inverters.
- Next to **Input Select** is the last reason the status was changed. In Radian-class inverters, the change is due to an event. Other possible reasons are Manual, Grid-Time, Load Grid, or HBX-Voltage. See the MATE3s Programming Guide for more information.
- **AC Input Status:** Displays the current interaction with the AC input. This screen will usually change to match Input Mode once a soft key command is given. In Radian-class inverters, the displayed AC voltage is the sum of the L1 and L2 phases.
- **<Drop>** and **<Use>** soft keys (B and C) manually disconnect or connect to the AC source.
- The **<Discon>** soft key (D) displays a screen with the reason for the last AC disconnect.

**Screen Items (D):**

This screen shows the reason for the inverter’s last automatic disconnection from the AC source. The possible reasons include** Input Frequency Too High, Input Frequency Too Low, Input Voltage < Maximum, or Input Voltage < Minimum. Radian-class and FXR-class inverters have Backfeed, Phase Lock, or Island Detect. Most items show **N** (no). If an item shows **Y** (yes), the inverter disconnected for that reason.

**FAVORITE**

The FAVORITE hot key (E) allows the user to program and select up to four frequently used (or “favorite”) screens for rapid access. It includes a green LED indicator.

To program the FAVORITE hot key:

1. Navigate to the desired screen.
2. Press and hold the FAVORITE hot key until the green indicator flashes.
3. Press one of the four programmable soft keys to select it for recalling that particular screen. The green FAVORITE LED indicator will stop flashing.
4. Repeat Steps 1-3 to program three more favorite screens (if desired).

**IMPORTENT**

Only one favorite screen can be programmed per soft key. Attempting to program more than one screen to the same soft key will overwrite the first screen.

Password-protected screens cannot be saved as favorites. This means that the screens described in the MATE3s Programming Guide cannot be saved this way. (These include any screens accessed with the LOCK key.)

To use the FAVORITE hot key to recall the desired screen(s):

1. Press and release the FAVORITE hot key. The green FAVORITE indicator will illuminate and stay on.
2. Press the soft key for the desired screen to be recalled.

**To download firmware:**

1. Remove the SD card from the MATE3s. (See B.)
2. Reformat and erase all existing files on the SD card.
3. From the OutBack page, download the latest firmware revision (C).

**CAUTION:** Equipment Damage

Make certain all card contents are removed. If previous firmware or files remain on the card during installation, the MATE3s could be permanently corrupted.

**IMPORTANT**

Make certain to extract (unzip) the files to the SD card. Do not save the file directly in its original compressed form. If the files are downloaded in compressed form, they will be unusable.