To de-energize or shut down the AC-coupled system:

1. Turn off (open) the AC circuit breakers.
2. Turn off (open) the DC circuit breakers for the battery.
3. Verify 0 Vdc on the first DC bus of the inverter by placing the voltmeter leads on and .
4. Verify 0 Vdc on the second DC bus by placing the voltmeter leads on and .
5. Verify 0 Vac on the AC output circuit breakers by placing the voltmeter leads on and . Repeat this step for and .
6. Verify 0 Vac on the grid-tied inverter terminals and (with neutral terminal ).

De-energize/Shutdown Procedures

Wait 5 minutes for the inverter to internally discharge itself.

WARNING: Lethal Voltage
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: Lethal Voltage
The numbered steps will remove power from the inverters. However, sources of energy may still be present inside the GSLC and other locations. To ensure absolute safety, disconnect ALL power connections at the source.

WARNING: Burn Hazard
Internal parts can become hot during operation. Do not remove the cover during operation or touch any internal parts. Be sure to allow them sufficient time to cool down before attempting to perform any product maintenance.

Components

Functional Test Points

- Battery Voltage Test Points
  - 16
  - 17
  - 18
- AC OUT Voltage Test Points (Terminal bus bar = TBB)
  - 22
  - 23
  - 24
- Grid-Tie Inverter Test Points
  - 22
  - 23
  - 24

Contact Technical Support:
Telephone: +1.360.618.4383
Email: Support@outbackpower.com
Website: www.outbackpower.com
WARNING: Fire/Explosion Hazard
Do not place combustible or flammable materials within 12 feet (3.7 m) of the equipment. This unit employs mechanical relays and is not ignition-protected. Fumes or spills from flammable materials could be ignited by sparks.

WARNING: Personal Injury
Use safe lifting techniques and standard safety equipment when working with this equipment.

IMPORTANT:
Clearance and access requirements may vary by location. Maintaining a 36” (91.4 cm) clear space front in the system for access is recommended. Consult local electric code to confirm clearance and access requirements for the specific location.

Radian Dimensions (includes MATE3):
29.1” (85 cm) tall X 23.9” (60.6 cm) wide

Radian Mounting:
1. Ensure the mounting surface is strong enough to handle 3 times the total weight of all the components. Add a piece of plywood if necessary to strengthen the surface.
2. Attach the wall bracket to the surface centering the mounting holes on the sides with the wall studs. Use all 6 mounting screws to secure the bracket.
3. Lift the inverter so that the inverter bracket is above the wall bracket.
4. Lower the inverter into place so that the inverter bracket slips into the wall bracket.
5. Secure the inverter to the surface using a minimum of 1 wall screw (or other appropriate hardware).
6. Follow the instructions for installing the GS Load Center.
7. Follow the instructions for installing the bracket for the MATE3.
8. Follow appropriate instructions for installing the PV array and grid-tied inverter (if not already present).

AC Wire Sizes & Torque Values

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWG</td>
<td>In-lb</td>
</tr>
<tr>
<td>#14 - 10</td>
<td>2.5 - 6</td>
</tr>
<tr>
<td>#8</td>
<td>10</td>
</tr>
<tr>
<td>#6 - 4</td>
<td>16 - 25</td>
</tr>
<tr>
<td>#3</td>
<td>35</td>
</tr>
<tr>
<td>#2</td>
<td>40</td>
</tr>
<tr>
<td>#1</td>
<td>50</td>
</tr>
<tr>
<td>10/10</td>
<td>70</td>
</tr>
</tbody>
</table>

It is recommended that conductors be #6 AWG THHN copper, or larger, rated to 75°C (minimum) unless local code requires otherwise.

Minimum DC Cable based on the DC Circuit Breaker

<table>
<thead>
<tr>
<th>DC Circuit Breaker</th>
<th>Cable Size</th>
<th>In-lb</th>
<th>Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>#6 AWG (16 mm²)</td>
<td>35</td>
<td>4.0</td>
</tr>
<tr>
<td>80</td>
<td>#4 AWG (25 mm²)</td>
<td>35</td>
<td>4.0</td>
</tr>
<tr>
<td>125</td>
<td>1/0 (70 mm²)</td>
<td>50</td>
<td>5.6</td>
</tr>
<tr>
<td>175</td>
<td>2/0 (70 mm²)</td>
<td>225</td>
<td>25.4</td>
</tr>
<tr>
<td>250</td>
<td>4/0 (120 mm²)</td>
<td>225</td>
<td>25.4</td>
</tr>
</tbody>
</table>

Torque Requirements

<table>
<thead>
<tr>
<th>Circuit Breaker Stud</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>20</td>
</tr>
<tr>
<td>1/4 - 20</td>
<td>35</td>
</tr>
<tr>
<td>5/16 - 18</td>
<td>50</td>
</tr>
<tr>
<td>3/8 - 16</td>
<td>225</td>
</tr>
</tbody>
</table>

DC Plates

| Upper holes (+)     | 60     | 6.6  |
| Lower holes (+)     | 50     | 5.6  |
| Shunt Bolts (-)     | 60     | 6.6  |

Control Wiring Terminal Block:
The 12V AUX and RELAY AUX terminals are used to control the devices which disconnect the grid-tied inverter (the ROCB and the relays). These devices can also automatically start a generator if one is present.

Control Wiring Terminal Block:
The 12V AUX and RELAY AUX terminals are used to control the devices which disconnect the grid-tied inverter (the ROCB and the relays). These devices can also automatically start a generator if one is present.

CAUTION: Equipment Damage
When connecting cables from the inverter to the battery terminals, ensure the proper polarity is observed. Connecting the cables incorrectly can damage or destroy the equipment and void the product warranty.
Pre-startup Procedures:
1. Double-check all wiring connections.
2. Inspect the enclosure to ensure no tools or debris has been left inside.
3. Disconnect all AC loads at the backup (or critical) load panel.
4. Disconnect the AC input feed to the GSLC at the source.

**CAUTION:** Equipment Damage Incorrect polarity will damage the equipment.

To energize the AC-coupled system:
1. Using a digital voltmeter (DVM), verify 48 Vdc on the DC input terminals and .
2. Confirm that the battery voltage is correct for the inverter model.
3. Turn on (close) the DC circuit breakers from the battery bank to the inverter.
4. Perform all programming (see the next section).
5. Start the generator (if present). Verify 120/240 Vac at the location of the AC sources.
6. Turn on (close) the grid AC input circuit breaker.
7. Turn on (close) the AC output circuit breakers.

**NOTE:**
Grid-tied or Backup required; Off Grid mode not supported for this application.

**IMPORTANT:**
Damage caused by inaccurate programming is not covered by the limited warranty for the system.
Failure to program accurate parameters for the system could potentially cause equipment damage.
Programming should be done by a qualified installer who is trained on programming inverter power systems.
Steps through required for proper operation.

**MATE3 Programming**

- **Configuration Wizard**
  - Grid Tied:
    - Available modes for Gen input: Gen, Support
    - Available modes for Grid input: Grid Tied, Backup
    - See the MATE3 manual for Advanced Generator Start and other setup features

- **Grid AC Input Mode and Limits**
  - Part 1:
    - Input Mode:
      - Transfer Delay: 0-5 Sec.
    - Automatic Mode:
      - Grid OUT Voltage Limits: 95 Vac Upper Vac, 105 Vac Lower Vac
      - Transfer delay: 0-5 Sec.

- **Grid AC Input Mode and Limits**
  - Part 1:
    - Input Mode:
      - Transfer Delay: 0-5 Sec.
    - Automatic Mode:
      - Grid OUT Voltage Limits: 95 Vac Upper Vac, 105 Vac Lower Vac
      - Transfer delay: 0-5 Sec.

- **Grid High Battery Transfer**
  - When the BMS detects a high voltage condition, the GSLC will transfer to the grid and will not attempt to reconnect to the battery bank.

- **Grid Low Battery Transfer**
  - When the BMS detects a low voltage condition, the GSLC will transfer to the battery bank and will not attempt to reconnect to the grid.

- **Grid Disconnect**
  - When the BMS detects a voltage condition, the GSLC will disconnect from the grid and will not attempt to reconnect until the voltage condition is cleared.

- **Grid Connect**
  - When the BMS detects a voltage condition, the GSLC will connect to the grid and will attempt to reconnect until the voltage condition is cleared.

- **Advanced Programming**
  - For more advanced settings and configurations, refer to the MATE3 manual.
General Wiring for AC-Coupled Applications

**AC LEGEND**
- Neutral (N)
- HOT L1
- HOT L2
- Ground

**AC Distribution Panel**
- L1
- L2
- NEU
- Ground-Ground Bond

**Ground Electrode Conductor (Ground Rod)**

**AC Generator**

**AC Subpanel**
- L1
- L2
- NEU
- GROUND

**Loads (240 Vac)**
- L1
- L2
- NEU
- GROUND

**Loads (120 Vac)**
- L1
- L2
- NEU
- GROUND

**Accessory Terminals**
- AC Source
- Accessory Terminals
- Battery Terminals

**RELAY LEGEND**
- Generator Start
- Relay AUX
- 12V AUX

**Relays (Top View)**
- Front Relay
- Rear Relay
- Insert wire
- Press straight down to unlock wire release mechanism

**IMPORTANT:** Example only. Actual wiring may vary depending on local electric codes. Factory wiring and inverter AC wiring are not shown.

**Battery Bank**

**PV and Grid Tie Inverter**

**MATE3 System Display**

**PV Generator**

**Legend**
- Neutral
- Neutral-Ground Bond
- Bond
- Hot L1
- Hot L2
- Grid
- Generator
- NEU
- IN
- IN
- GND
- IN
- IN
- GND
- IN
- IN
- Battery
- INV
- Remote Battery
- Battery Temp
- Remote Operated Device
- Severe Shock Hazard

**Remote Battery**

**Battery Bank**

**PV and Grid Tie Inverter**

**MATE3 System Display**

**Legend**
- Negative
- Positive
- Ground

**Neutral**

**HOT L1**

**HOT L2**

**GROUND**

**AC Generator**

**AC Subpanel**

**Loads (240 Vac)**

**Loads (120 Vac)**

**Accessory Terminals**

**Relays (Top View)**

**Front Relay**

**Rear Relay**

**Insert wire**

**Press straight down to unlock wire release mechanism**

**IMPORTANT:** Example only. Actual wiring may vary depending on local electric codes. Factory wiring and inverter AC wiring are not shown.