**Components**

**MATE3 Programming**

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

**Components**

- **AC Source**
  - Utility Grid
  - AC Generator

- **AC Enclosure Box**
  - FW900-AC

- **AC Bypass Assembly**
  - FW-IOBD-120/240VAC
  - FW-IOBD-120VAC

- **PV Combiner Box**
  - Balancing Transformer: FW-X240

- **Battery Bank**
  - 12 V Inverter
  - 24 V Inverter
  - 48 V Inverter

- **Communications Manager**
  - HUB4

- **Customer-Supplied Components**
  - Main Electrical Panel
  - AC Source
  - Utility Grid, or AC Generator
  - Electrical Distribution Subpanel (Load Panel)
  - Battery Bank
  - Photovoltaic (PV) Array (with PV Combiner Box)

- **Optional OutBack Components**
  - Balancing Transformer: FW-X240

- **LED Indicators on the Inverter**

- **FNDC LED Indicators**

- **Surge Protector LEDs**

**MATE3 Programming**

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

**Off Grid**

- **System Type**
  - Stationary
  - Grid Tie
  - Backup

- **Battery Capacity**

- **Grid Tie**
  - **System Type**
  - Stationary
  - Grid Tie
  - Backup

- **Backup**
  - **System Type**
  - Stationary
  - Grid Tie
  - Backup

**Note:** For automatic generator start features see the MATE3 manual for details.

**Contact Technical Support:**
- Telephone: +1.360.618.4363
- Email: Support@outbackpower.com
- Website: www.outbackpower.com

**FNDC LED Indicators**

<table>
<thead>
<tr>
<th>Color</th>
<th>Battery State-of-Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>&gt; 95% (if charge parameters are met)</td>
</tr>
<tr>
<td>Yellow</td>
<td>90% to 95%</td>
</tr>
<tr>
<td>Yellow</td>
<td>85% to 90%</td>
</tr>
<tr>
<td>Yellow</td>
<td>70% to 85%</td>
</tr>
<tr>
<td>Yellow</td>
<td>60% to 70%</td>
</tr>
<tr>
<td>Yellow</td>
<td>50% to 60%</td>
</tr>
<tr>
<td>Yellow</td>
<td>&lt; 50% solid, &lt; 50% blinks</td>
</tr>
</tbody>
</table>

**Battery Status LED Indicators**

<table>
<thead>
<tr>
<th>Color</th>
<th>12 V Inverter</th>
<th>24 V Inverter</th>
<th>48 V Inverter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>25.0 Vdc or higher</td>
<td>25.5 Vdc or higher</td>
<td>26.0 Vdc or higher</td>
</tr>
<tr>
<td>Yellow</td>
<td>22.5 Vdc or higher</td>
<td>23.0 Vdc or higher</td>
<td>23.5 Vdc or higher</td>
</tr>
<tr>
<td>Red</td>
<td>17.4 Vdc or lower</td>
<td>22.8 Vdc or lower</td>
<td>24.6 Vdc or lower</td>
</tr>
</tbody>
</table>

**Inverter Status LED Indicators**

- **Green:** Inverter on (solid) or standing by (flash)
- **Yellow:** AC source in use (solid) or standing by (flash)
- **Red:** Inverter error or warning (see manual)
FP2 Dimensions:
20.25" (51.4 cm) H X 36.5" (92.6 cm) W X 13.5" (34.3 cm) D

FP2 Mounting:
1. Ensure the mounting surface is strong enough to handle 3 times the total weight of all the components.
2. Using additional people to assist with lifting, place the panel on the wall. Ensure the panel is level.
3. Secure the panel into the surface using a minimum of 10 lag bolts (or other appropriate hardware).
4. Remove the covers from the AC Enclosure and the DC Enclosure.
5. Follow the instructions for installing the brackets for the MATE3.
6. Follow the instructions for installing the brackets for the charge controllers.

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 in front of the system for access is recommended. Consult local electric code to confirm clearance and access requirements for the specific location.

Wire Sizes/Torque Requirements

AC Wire Sizes and Torque Values

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4 - 10</td>
<td>2.5 – 6</td>
</tr>
<tr>
<td>#6 - 4</td>
<td>2.5 – 6</td>
</tr>
<tr>
<td>#8 - 2</td>
<td>1.8</td>
</tr>
<tr>
<td>#10 - 2</td>
<td>1.5</td>
</tr>
<tr>
<td>#12 - 2</td>
<td>1.2</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.

Control Wiring Terminal Block:
The Inverter ON/OFF terminals are used for connecting an external ON/OFF switch. To use this feature, the jumper must be removed. (See installation manual for details.)
The AUX terminals provide a 12 Vdc signal. The AUX terminals can be used to start a generator or to control external devices. AUX terminals are also available on the charge controller and the FLEXnet DC. (See the charge controller or FNDC installation manuals for details.)

Control Wiring Terminal Block:
The Inverter ON/OFF terminals are used for connecting an external ON/OFF switch. To use this feature, the jumper must be removed. (See installation manual for details.)
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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.

Minimum DC Cable based on the DC Circuit Breaker

<table>
<thead>
<tr>
<th>Circuit Breaker Stud</th>
<th>Torque</th>
<th>DC Circuit Breaker</th>
<th>Cable Size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/16 – 16</td>
<td>50</td>
<td>1/0</td>
<td>225</td>
<td>25.4</td>
</tr>
<tr>
<td>1/4 – 20</td>
<td>70</td>
<td>3/8 – 16</td>
<td>250</td>
<td>25.4</td>
</tr>
<tr>
<td>3/8 – 16</td>
<td>70</td>
<td>1/0</td>
<td>225</td>
<td>25.4</td>
</tr>
<tr>
<td>5/16 – 16</td>
<td>50</td>
<td>3/8 – 16</td>
<td>225</td>
<td>25.4</td>
</tr>
<tr>
<td>1/2 – 18</td>
<td>90</td>
<td>1/2</td>
<td>250</td>
<td>25.4</td>
</tr>
</tbody>
</table>

WARNING: Personal Injury
Use safe lifting techniques and standard safety equipment when working with this equipment.
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 AC loads at the load panel.
4. Disconnect AC inputs at the source.

Functional Test Points

Battery Voltage Test Points

PV Voltage Test Points

AC OUT Voltage Test Points (Terminal bus bar = TBB)

AC IN Voltage Test Points (Terminal bus bar = TBB)

To energize or start up the OutBack devices:
1. Using a digital voltmeter (DVM), verify 12, 24, or 48 Vdc on the DC plates by placing the DVM leads on $1$ and $2$. Confirm that the voltage is correct for the inverter and charge controller models. Confirm the polarity.
2. Turn on (close) the GFDI circuit breaker.
3. Verify that the PV output for each charge controller is in the correct range of open-circuit voltage and confirm the polarity by:
   a) placing the DVM leads on $3$ and $4$,
   b) placing the DVM leads on $5$ and $6$.
4. Turn on (close) the PV input circuit breakers.
5. Turn on (close) the AC output circuit breakers.
6. Verify 120 Vac on the AC Output L1 TBB by placing the DVM leads on $7$ and $8$.
7. Verify 240 Vac between the AC Output TBBs by placing the DVM leads on $9$ and $10$.
8. Verify 240 Vac between the AC Output TBBs by placing the DVM leads on $11$ and $12$.

To de-energize or shut down the OutBack devices:
1. Turn off (open) the AC circuit breakers.
2. Turn off (open) the DC circuit breakers for the battery. Wait 5 minutes for the devices to internally discharge themselves.
3. Turn off (open) the PV circuit breakers.
4. Turn off (open) the GFDI circuit breaker.
5. Verify 0 Vdc on the DC input terminal of the master inverter by placing the voltmeter leads on $13$ and $14$.
6. Verify 0 Vdc on the DC input terminal of the slave inverter by placing the voltmeter leads on $15$ and $16$.
7. Verify 0 Vac on the AC output circuit breakers by placing the voltmeter leads on $17$ and $18$. Repeat this step for $19$ and $20$.

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

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 inverter and charge controllers. However, sources of energy may still be present in the AC and DC wiring boxes. 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 the parts sufficient time to cool down before attempting to perform any maintenance.