

## EG4: How to AC Couple on Load Port w/ EG4<sup>®</sup> Hybrid Inverter and GridBOSS

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This document provides guidelines and best practices for configuring AC coupling on the load port of the FlexBOSS21 inverter using microinverters connected through the Load port. Based on extensive lab testing conducted by EG4<sup>®</sup> Electronics R&D Lab, this configuration enables efficient solar energy utilization even during grid outages.

### System Components

- **Inverter:** FlexBOSS21 (MN: IV-1600-HYB-AW-FX-00, Firmware: 1F1F)
- **Grid Management:** GridBOSS (Firmware: IAAB-1100)
- **AC Coupling Device:** AP Smart Microinverters (Connected through Load port)

### Hardware Setup

1. Connect the Grid Tied/Hybrid/Microinverter to the Load port of the FlexBOSS 21.
2. Ensure GridBOSS is properly connected to the system

### Off-Grid Operation

When grid power is disconnected, the system:

1. Microinverters restart with a 5-minute reconnection delay
2. After reconnection, microinverters continue powering loads
3. Batteries provide supplemental power as needed

### System Behavior Observations

- **Consistent A/C Couple Icon:** The A/C Couple icon remains on at all times in the display (noted as an issue)
- **Power Flow Priority:** The system intelligently directs AC coupled power to loads first, reducing grid consumption
- **Seamless Transition:** When transitioning to off-grid mode, the system requires a 5-minute reconnection period but maintains power to critical loads

## Implementation Guidelines

### Best Practices

#### 1. System Sizing:

- Ensure your battery capacity is sufficient for the reconnection delay in off-grid scenarios
- Size microinverters appropriately to match both charging and load requirements

#### 2. Firmware Compatibility:

- Verify firmware versions match tested configurations (FlexBOSS21: 1F1F, GridBOSS: IAAB-1100)
- Check for firmware updates before installation

#### 3. Installation Considerations:

- Follow standard electrical codes and safety practices
- Implement proper grounding for all components
- Ensure adequate ventilation for all equipment

### Troubleshooting

- **Always-On A/C Couple Icon:** This is a known issue with the current firmware and doesn't affect system functionality
- **Reconnection Delay:** A 5-minute delay for microinverter reconnection is normal behavior and provides grid stability
- **Power Measurement Discrepancies:** Minor differences between displayed and metered values are normal (typically within 10%)

AC coupling from the load port of the FlexBOSS21 inverter through the EPS port provides an effective solution for maximizing solar energy utilization in both grid-connected and off-grid scenarios. The system demonstrates reliable performance in battery charging and load management, with seamless transitions between operational modes.

The current configuration provides optimal integration between the FlexBOSS21, GridBOSS, and Grid Tied/Hybrid/Microinverters, enabling flexible energy management strategies for residential and commercial applications.