

EG4 ELECTRONICS

EG4 GridBOSS and FlexBOSS21
Product Launch



TABLE OF CONTENTS

1. Introduction.....	3
2. EG4 GridBOSS Technical Overview.....	4
a. Practical Service Entrance.....	4
b. Compatibility and Hybrid Integration.....	4
c. Generator and AC Coupling Support.....	4
d. Smart Ports for Load Management.....	4
e. Compact and Durable Design.....	4
3. EG4 FlexBOSS21 Technical Overview.....	5
a. Versatile Hybrid Inverter.....	5
b. Power and Output Capabilities.....	5
c. Surge Capacity and Start-Up Power.....	5
d. Enhanced MPPT Design.....	5
e. GridBOSS Compatibility.....	5
f. Comparing the FlexBOSS21 with the 18kPV.....	6
4. Use Cases for GridBOSS and FlexBOSS21.....	7
a. Elimination of Main Panel Upgrades and Critical Load Subpanels.....	7
b. True Whole Home Backup for Residential Customers.....	7
c. Optimal Load Control for NEM and TOU Customers.....	7
d. Scalable Backup Solutions.....	7
e. Ease of AC Coupling and Versatile System Integration.....	7
5. Common Application Scenarios.....	9
6. GridBOSS/FlexBOSS21 VS. Traditional Setups.....	11
7. Conclusion.....	13

INTRODUCTION

The GridBOSS serves as a centralized service entrance, connecting the utility grid, hybrid inverters, generators, smart loads, and AC-coupled inverters. This simplifies power distribution and reduces the complexity of traditional setups. When paired with the versatile FlexBOSS21, which supports up to 21kW usable PV (DC) input for both on-grid and off-grid applications, the GridBOSS enhances energy management and power generation capabilities.

This white paper details the technical specifications and practical applications of the GridBOSS and FlexBOSS21, highlighting their compatibility with existing systems and the potential for significant cost savings. Together, they provide efficient, scalable solutions for energy management.

EG4 GRIDBOSS TECHNICAL OVERVIEW

2.A Practical Service Entrance

The EG4 GridBOSS is engineered to function as a comprehensive service entrance solution, rated for up to 200A and featuring a 22kAIC (kiloampere interrupting capacity). This robust design accommodates a 200A pass-through, allowing for both 200A backup (BU) loads and 200A non-backup loads, ensuring reliable power distribution across various applications.

2.B Compatibility and Hybrid Integration

The GridBOSS is fully compatible with EG4's range of hybrid inverters, including the 12kPV, 18kPV, and FlexBOSS21. This integration capability enables customers to leverage the benefits of hybrid inverter technology, supporting up to three inverters with an output of up to 90 Amps each. This flexibility allows for scalable energy configurations tailored to the specific power requirements of residential or commercial systems.

2.C Generator and AC Coupling Support

Designed to enhance energy resilience, the GridBOSS supports generator connections up to 125A, accommodating units of up to 30kW. Additionally, it facilitates AC coupling for solar PV systems, supporting up to 125A through its smart ports. This capability allows for the integration of renewable energy sources while maintaining seamless operation across all system components.

2.D Smart Ports for Load Management

The GridBOSS features four smart ports, rated at 125A, 80A, 60A, and 60A, each of which can be programmed for either smart loads or AC coupling. This innovative design supports advanced load management strategies, including load and power shedding, to optimize energy usage during peak demand periods or in the event of limited power availability. The ability to manage loads intelligently enhances the overall efficiency and reliability of your energy system.

2.E Compact and Durable Design

With dimensions of 31.5 x 19.7 x 7.0 inches and a weight of 60 lbs., the GridBOSS is designed for easy installation while providing a robust solution for energy management. Its compact form factor makes it suitable for various installation environments without compromising performance or capacity.



EG4 FLEXBOSS21 TECHNICAL OVERVIEW

3.A Versatile Hybrid Inverter

The EG4 FlexBOSS21 is a robust hybrid inverter engineered for seamless functionality across sell-back, off-grid, and grid-tied modes. Its multi-functional design enables versatile energy use, adapting to diverse system requirements for both residential and commercial applications. The FlexBOSS21 supports common voltage configurations—120/240VAC, 208VAC—and operates at 50/60Hz, making it adaptable for various grid standards and locations.

3.B Power and Output Capabilities

The FlexBOSS21 delivers substantial output power with 16kW (66.7A at 240VAC) to grid or loads from PV and battery, and 12kW (50A at 240VAC) for direct battery-to-load applications. With 21kW of usable solar PV and a recommended maximum array of 24kW, the FlexBOSS21 can accommodate high-power installations, maximizing solar input for larger systems.



3.C Surge Capacity and Start-Up Power

Equipped with exceptional surge capabilities, the FlexBOSS21 can handle demanding start-up loads. From battery only, it offers up to 13.5kVA for 10 minutes, providing enough capacity to start challenging loads like a 5-ton air conditioning unit.

3.D Enhanced MPPT Design

The FlexBOSS21 includes three optimized Maximum Power Point Trackers (MPPTs), configured at 26A/26A/15A and supporting up to five strings, accommodating panels of up to 13A at up to three orientations. This configuration allows maximum efficiency and flexibility in panel layout, providing optimal energy capture even with varied orientations and shading conditions.

3.E GridBOSS Compatibility

When integrated with the EG4 GridBOSS, the FlexBOSS21 can support AC-coupled PV setups, smart load management, and generator support, enabling a fully integrated energy management solution. A new MPPT improvement to 26A/26A/15A from 25A/15A/15A further optimizes energy capture and conversion, enhancing system efficiency and responsiveness.

EG4 FLEXBOSS21 TECHNICAL OVERVIEW

3.F Comparing the FlexBOSS21 with the 18kPV

The FlexBOSS21 inverter is engineered to provide enhanced capacity and performance for solar and battery systems, building upon the foundation set by the EG4 18kPV-12LV All-In-One Hybrid Inverter model. Key upgrades include:

Feature	FlexBOSS21	18kPV
Usable Solar PV Capacity	21 kW	18 kW
Output to Grid/Load	Up to 16 kW (66.7A) from battery and PV with grid present	12 kW (50A)
MPPT Current Ratings	26A / 26A / 15A	25A / 15A / 15A
Design	30.4x22.3x11.2 in., 110 lbs.	34.3x20.5x11.2 in., 121 lbs.

Additionally, firmware updates improve the performance, efficiency, and reliability of the FlexBOSS21, adding practical value for both installers and end-customers.

USE CASES FOR GRIDBOSS AND FLEXBOSS21

4.A Elimination of Main Panel Upgrades and Critical Load Subpanels

The GridBOSS simplifies energy management by eliminating the need for expensive main panel upgrades and critical load subpanels. In either a FlexBOSS21 single inverter or multiple inverter configuration, customers can typically save between \$3,000 and \$7,500 compared to traditional inverter installations like the 18kPV. This reduction in upfront costs makes it an attractive option for homeowners and businesses looking to optimize their investment in energy systems.

4.B True Whole Home Backup for Residential Customers

The combination of GridBOSS and FlexBOSS21 enables true whole home backup capabilities for residential customers, going beyond traditional whole-panel backup. This is particularly beneficial for households with large energy loads, such as central HVAC systems, EV chargers, or electric hot water heaters. Customers can rest assured that their entire home remains powered during outages.

4.C Optimal Load Control for NEM and TOU Customers

For customers participating in Net Energy Metering (NEM) or Time of Use (TOU) programs, the GridBOSS and FlexBOSS21 facilitate maximum load control. This allows customers to optimize their energy consumption and production based on utility pricing, helping them reduce energy costs while maximizing their solar investment.

4.D Scalable Backup Solutions

The system provides an expansion path from partial to true whole home backup, making it ideal for large homes or systems. This scalability allows customers to start with a smaller system and expand as their energy needs grow, ensuring they can adapt their system without major disruptions.

4.E Ease of AC Coupling and Versatile System Integration

The GridBOSS features smart ports and supports easy AC coupling, accommodating a variety of configurations including AC-coupled solar, generator backup, smart loads, and EV chargers.

USE CASES FOR GRIDBOSS AND FLEXBOSS21

This flexibility allows customers to tailor their energy systems to meet specific needs, whether for residential or small commercial applications on 120/240 VAC split-phase services.

The integration of smart panel technology enhances the overall functionality of the GridBOSS and FlexBOSS21 system, allowing for better load management and monitoring. This capability enables customers to effectively manage their energy consumption and optimize performance across their energy systems.

COMMON APPLICATION SCENARIOS

Common application scenarios for the GridBOSS and FlexBOSS21 are shown in the images below. For more information about system operation, see section 8 of the latest edition of the GridBOSS User Manual, available at the [EG4 Electronics website](http://www.eg4electronics.com). Please note that the breakers displayed in Figure 2 are the maximum supported sizes for each port. The maximum allowed total output amperage is set at 200A. If the current draw exceeds 200A, GridBOSS will begin to limit load output.

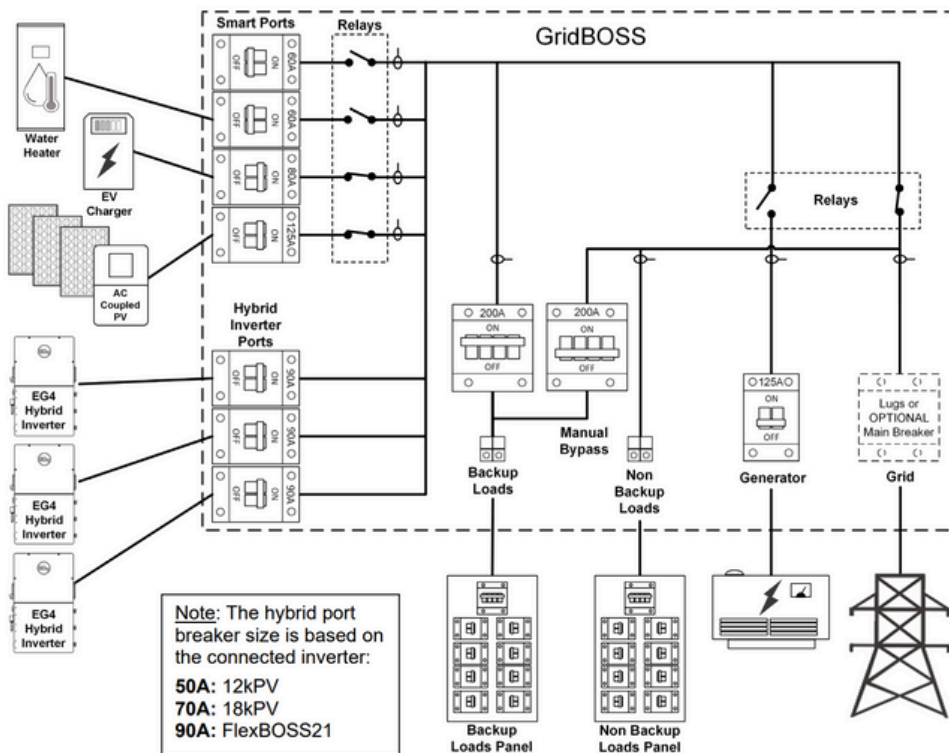


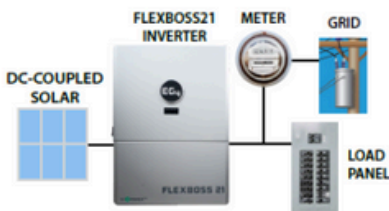
Figure 1. Common GridBOSS and FlexBOSS21 application scenarios

The FlexBOSS21, GridBOSS, and its associated systems are suitable for the following applications. For more information, look at section 6 of the FlexBOSS21 user manual, also available at the [EG4 Electronics website](http://www.eg4electronics.com).

COMMON APPLICATION SCENARIOS

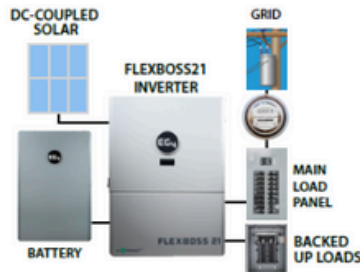
WITHOUT GRIDBOSS

Grid-Tie Only



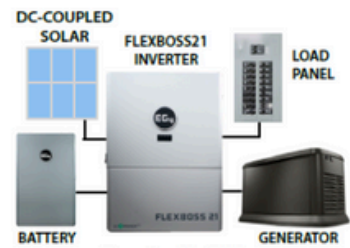
- Maximize Solar Offset
- Low Initial Cost - Simple
- No Storage
- No Solar when Grid down

Grid-Tie w Battery Backup (GTBB)



- Modest system for infrequent outages & partial home backup

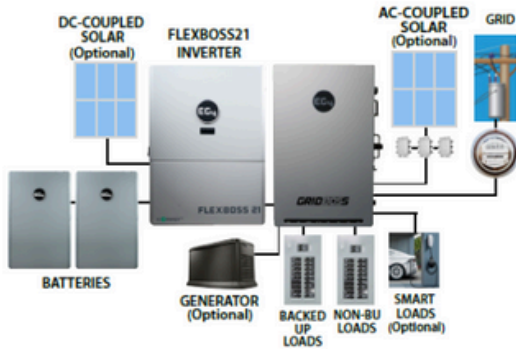
Fully Off-Grid



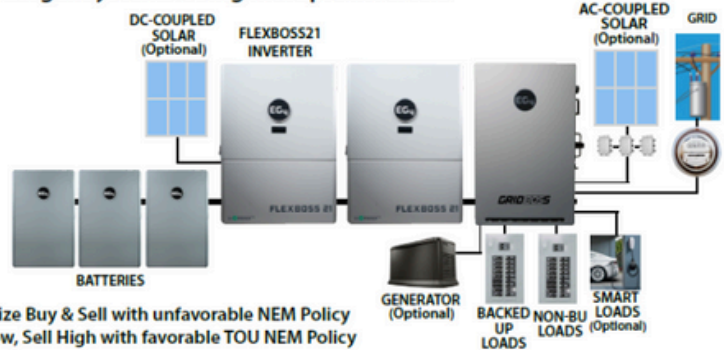
- Remote - No Grid
- Grid Expensive
- Add Grid Backup Later
- Self-Reliance
- Energy Autonomy

WITH GRIDBOSS

Minimize or Optimize Net Energy Metering



Larger Systems Using Multiple Inverters



- Minimize Buy & Sell with unfavorable NEM Policy
- Buy Low, Sell High with favorable TOU NEM Policy
- Reduce Demand Charges
- Smart Loads allow for Whole-Home Backup
- Off-Grid Capable

Figure 2. FlexBOSS21 and GridBOSS system diagrams

GRIDBOSS/FLEXBOSS21 VS. TRADITIONAL SETUPS

See the images below for a side-by-side comparison of conventional and GridBOSS/FlexBOSS21 scenarios. Figures 3 and 4 illustrate a traditional two-inverter installation setup, highlighting its standard design and layout. In contrast, Figures 5 and 6 present the GridBOSS/FlexBOSS21 configuration, showcasing the streamlined and efficient design that these solutions bring to solar and energy management systems.



Figure 3. Conventional installation

GRIDBOSS/FLEXBOSS21 VS. TRADITIONAL SETUPS

2 EG4 18kPV Inverters - Whole Home Backup on Supply Side Tap

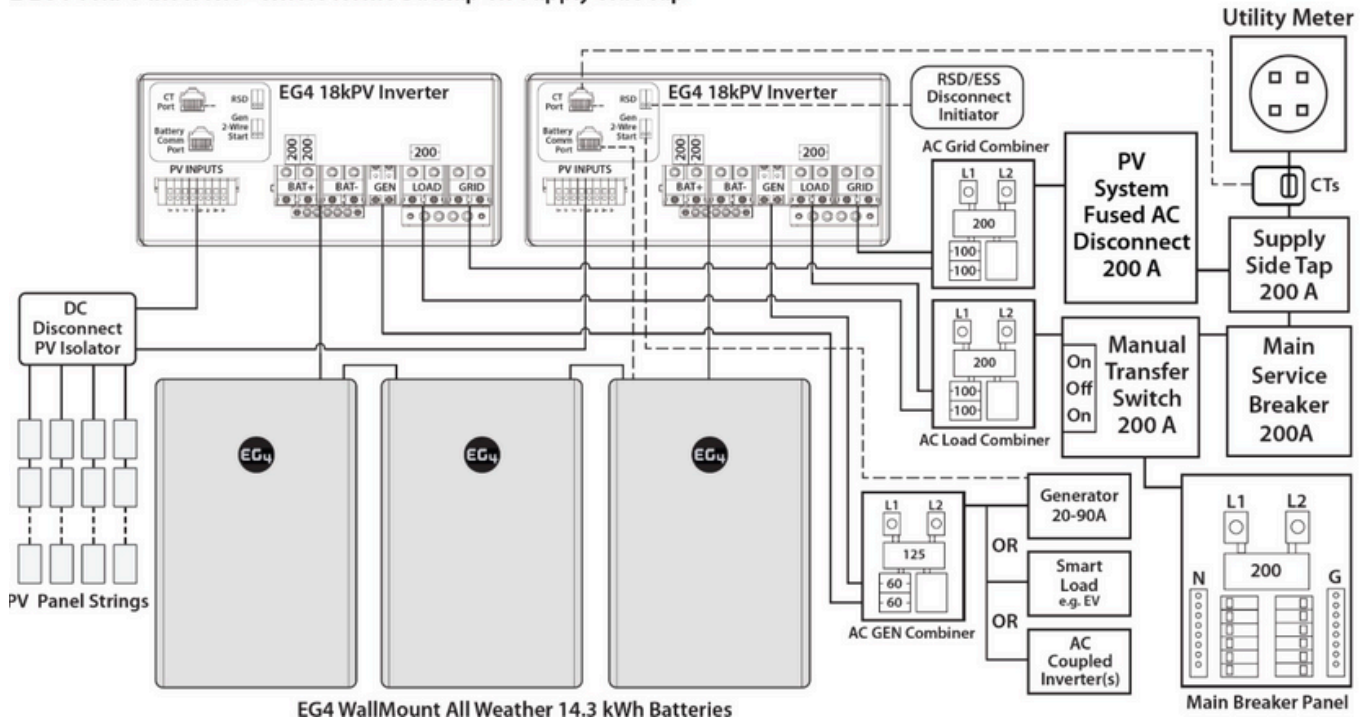


Figure 4. Conventional line diagram



Figure 5. Installation using GridBOSS

GRIDBOSS/FLEXBOSS21 VS. TRADITIONAL SETUPS

EG4 GRIDBOSS with 2 FLEXBOSS 21 INVERTERS

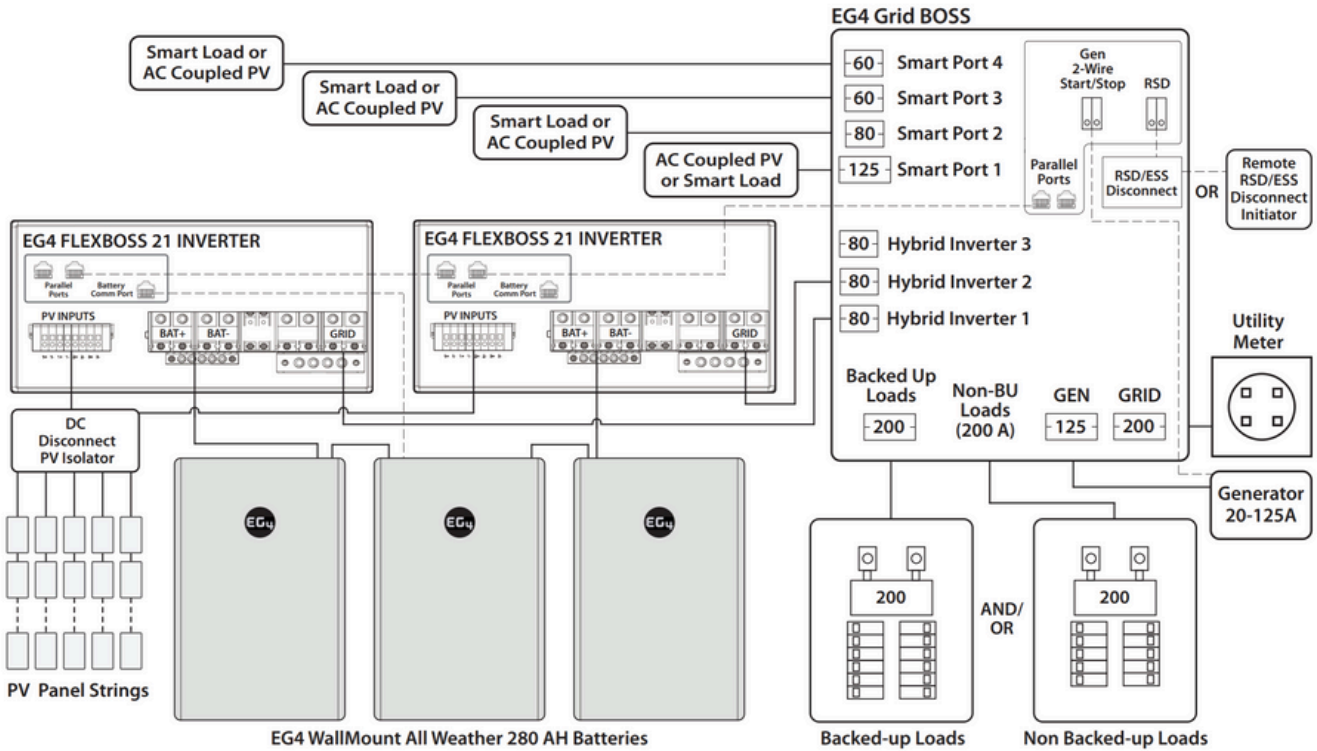


Figure 6. Line Diagram using GridBOSS and FlexBOSS21

CONCLUSION

The EG4 GridBOSS and FlexBOSS21 Hybrid Inverter provide an efficient, adaptable energy management solution for residential and small commercial settings. The GridBOSS simplifies integration as a centralized service entrance, while the FlexBOSS21 boosts solar generation and scalability. Together, they streamline power distribution, saving on costs and installation time. With multi-inverter compatibility, real-time monitoring, and robust output, they enable whole-home backup and smart load management to meet modern energy demands.