EG4 Inverters: Mastering Grid Interaction with Advanced Operational Modes

1. INTRODUCTION

In today's modern energy landscape, more and more distributed energy resources (DERs) are coming online. Therefore, ensuring safe and reliable interaction with the various grid scenarios is paramount. The UL 1741 CRD-PCS (Certification Requirement Decisions for Power Control Systems) serves as a critical standard for ensuring integration of DERs into the electrical grid. The UL 1741 CRD-PCS (Certification Requirement Decision for Power Control Systems) establishes rigorous testing and certification standards for PCS, focusing on critical functionalities such as operational modes, export/import limiting, and overall grid interaction.

For customers, particularly those in states like California, compliance with this standard is not just a feature, it's a necessity. Utilities like PGE, SDGE, and others require adherence to UL 1741 CRD-PCS for grid interconnection, meaning that inverters must be able to operate in one of the defined/approved working modes to ensure grid stability and safety. EG4 hybrid inverters are here to showcase their ability to meet these strict regulatory requirements while offering flexible operational modes that fit diverse energy scenarios.

2. WHY CRD-PCS COMPLIANCE MATTERS

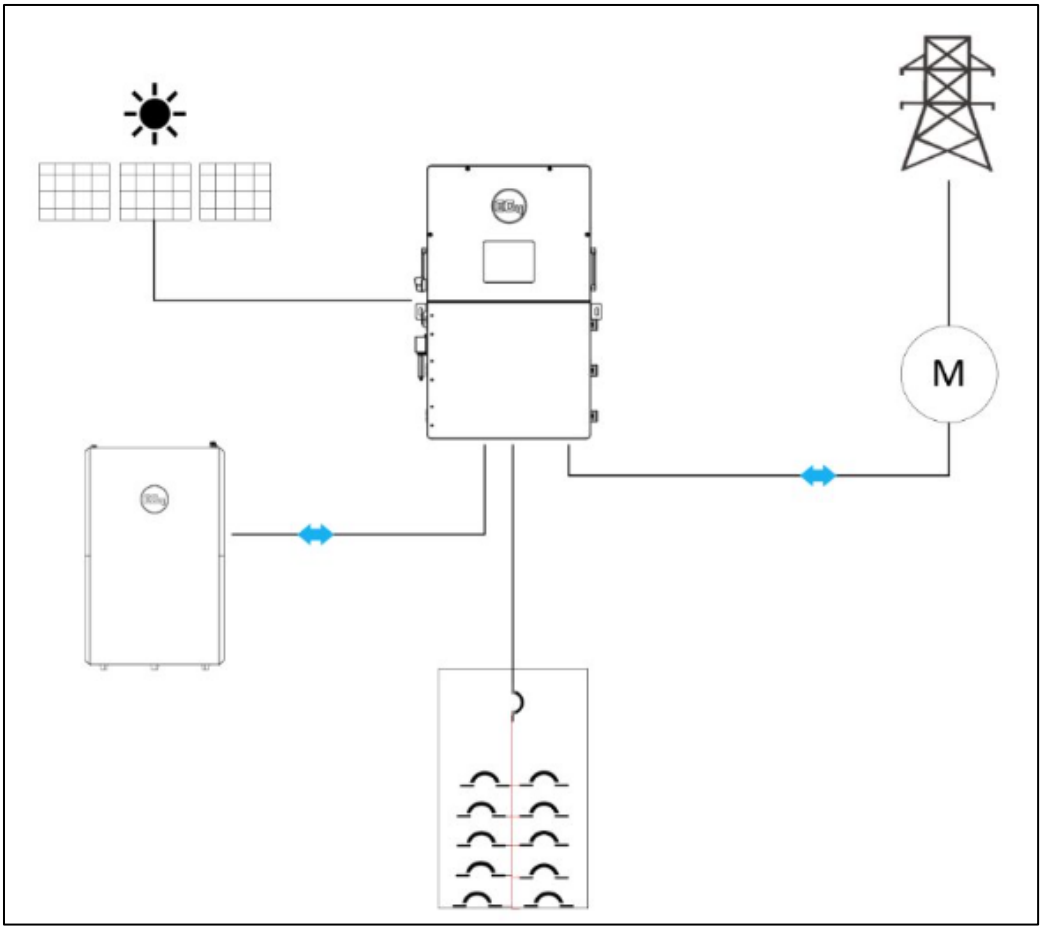
You may be wondering, "Why is CRD-PCS compliance so important?" For customers in states where regulations are increasingly stringent, this compliance is mandatory for grid-tied solar systems. UL 1741 CRD-PCS compliance allows EG4 inverters to seamlessly interact with the utility by offering control over how much energy is exchanged. This ensures not only the stability of the grid but also compliance with local utility requirements, such as those imposed by PGE, which may force customers to operate in a particular working mode.

Put simply, this feature proves that EG4 inverters meet the rigorous standards set by utilities, providing peace of mind that the system is compliant, reliable, and future-proof.

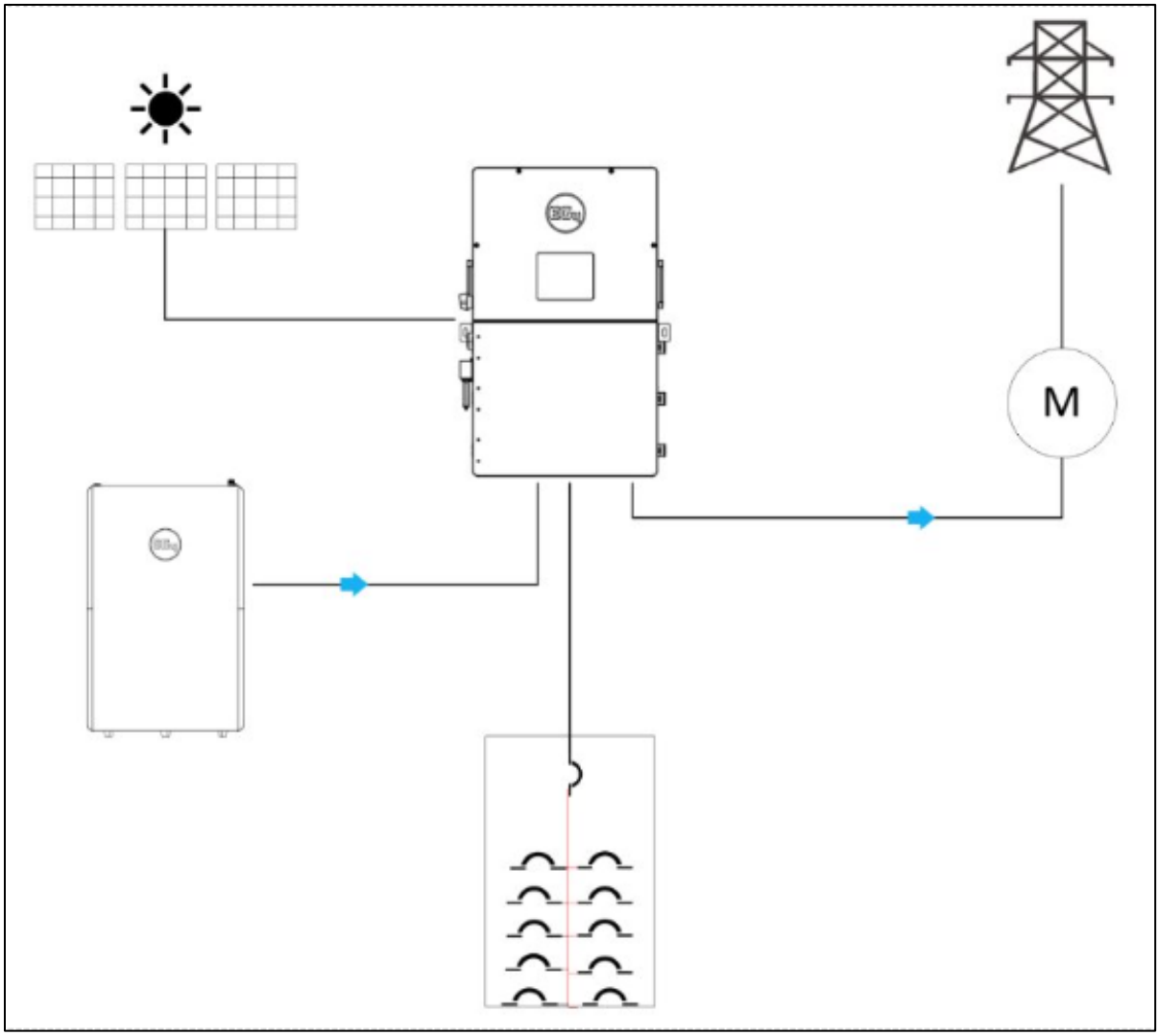
2.1 Operational Modes: What They Mean for You

EG4 hybrid inverters have successfully proven compliance with the four operational modes defined by UL 1741 CRD-PCS. It is important to note that this feature applies directly to the relationship between ESS and grid, and does not affect PV production or sell-back via PV. CRD PCS only applies to batteries and the grid. Here's a breakdown of each mode and why it matters to both homeowners and businesses:

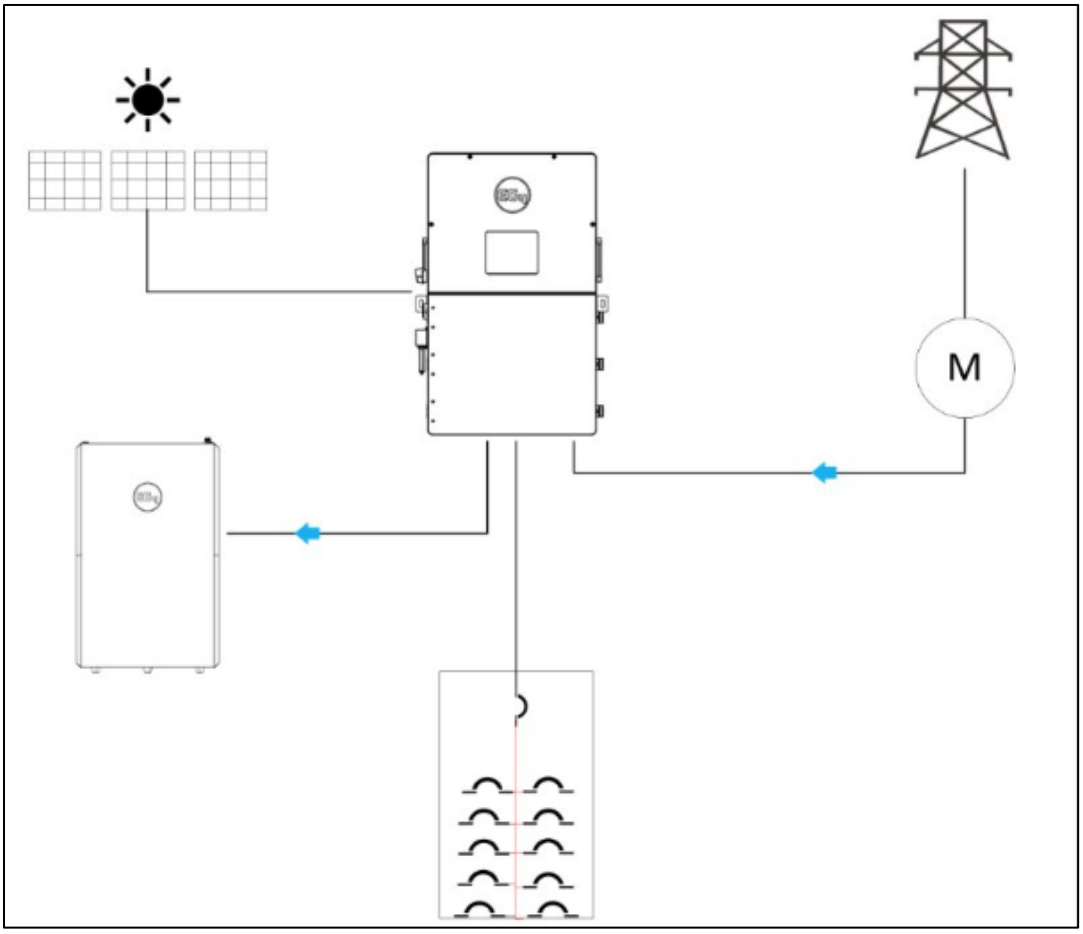
- **Unrestricted Mode:** This is the default mode for the EG4 inverter. It allows for two-way power flow between the energy storage system (ESS) and the grid. This mode offers maximum flexibility, enabling users to both draw from and feed excess power back into the grid.
    - **Partial Home Backup CRD-PCS Unrestricted Mode:**



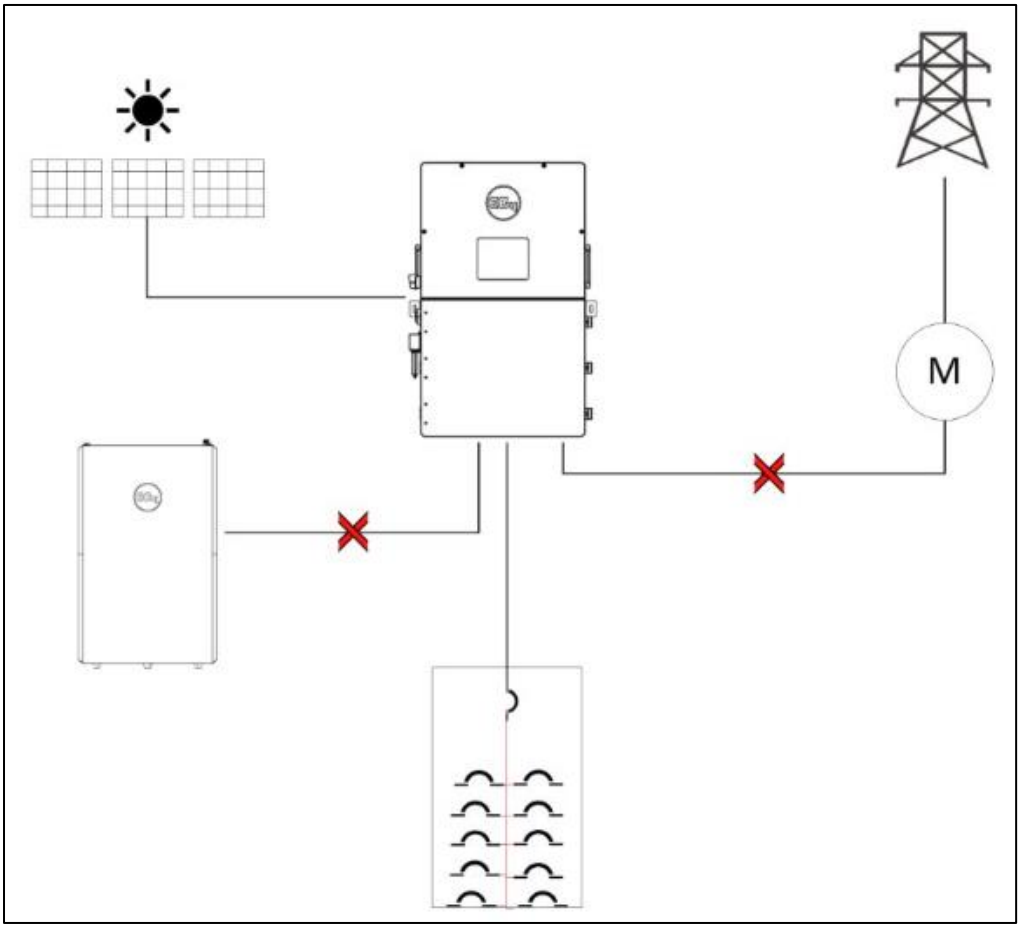
- **Export-Only Mode:** Permits only discharging energy from the ESS(battery) to the grid but does not allow the grid to be used to charge the ESS. Does not affect export of PV directly from solar.
    - **Partial Home Back CRD PCS Export Only Mode:**



- **Import-Only Mode:** Allows the ESS to draw power from the grid and charge batteries but does not allow batteries to be discharged to the grid.
    - **Partial Home Backup CRD PCS Import Only Mode:**



- **No-Exchange Mode:** This mode is essentially self-consumption, as the ESS will not be able to rely on the grid. It prevents any energy exchange (whether charging or discharging) between the ESS and the grid.
    - **Partial Home Backup CRD-PCS No Exchange Mode:**



3. HOW EG4 INVERTERS ENSURE GRID STABILITY: EXPORT AND IMPORT LIMITING

Another important feature of EG4 hybrid inverters is their ability to manage export and import limiting. By precisely controlling the amount of power flowing to and from the grid or main panel, these inverters contribute to a balanced and reliable energy ecosystem and avoid the possibility to overload the BUSBAR/conductor. Rather than requiring expensive upgrades to your electrical system to handle increased power output, the EG4 inverter can intelligently limit the amount of power sent back to the grid.

3.1 THE KEY BENEFITS OF EG4 INVERTERS BEYOND SOLAR POWER

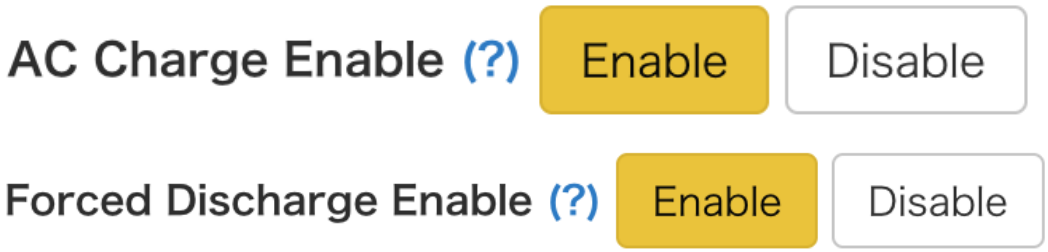
EG4 inverters not only excel in converting sunlight into usable electricity but also offer a range of advantages stemming from their compliance with the UL 1741 CRD-PCS standard. Here are a few:

- **Avoid Costly Main Panel Upgrades:** Many traditional grid-tied solar systems require expensive main panel upgrades to handle increased power output. EG4 hybrid inverters eliminate this need by limiting power output intelligently, potentially saving homeowners thousands of dollars in upgrade costs.
- **Effortless Grid Connection:** Meeting the standards set by utilities like PGE, SGIP, and SDGE means a smoother interconnection process. Homeowners can install their systems more quickly and with fewer headaches, as the compliance of EG4 inverters speeds up the permitting and approval process.
- **Future-Proof Your investment:** The electrical grid is evolving, with new regulations and standards emerging regularly. EG4 inverters, by adhering to CRD-PCS compliance, ensure that the system is ready for future grid requirements. This future-proofing eliminates the need for costly retrofits or replacements as grid requirements continue to evolve.

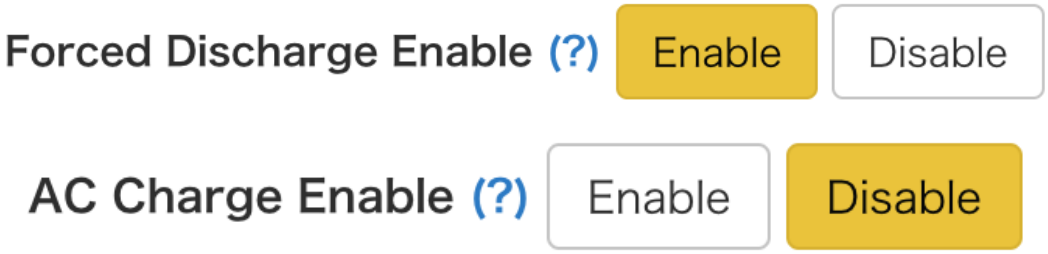
4. WORKING OF EACH MODE OF CRD-PCS

- *Please refer to manual on how to set the settings*

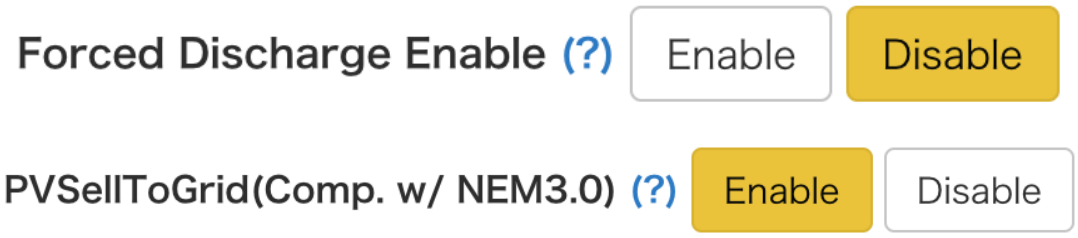
- **Unrestricted Mode:**
  - **Enable both AC Charge and Forced Discharge**



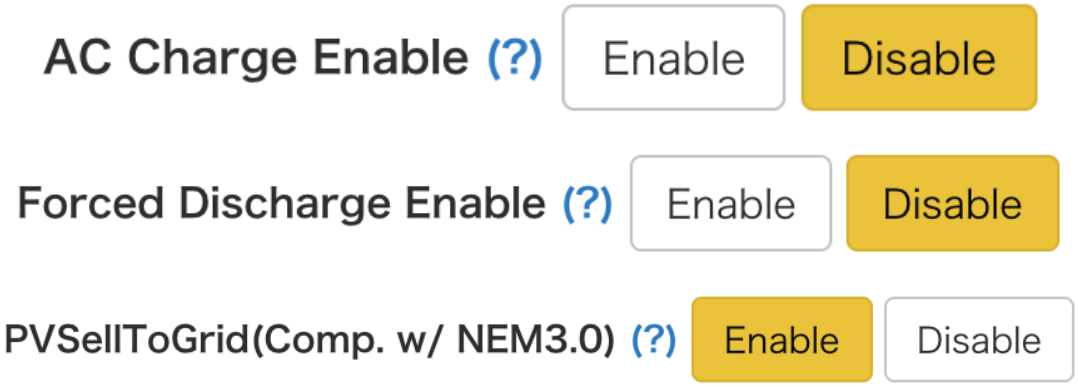
- **Export Only Mode:**
  - **Enable Forced Discharge Enable and Disable AC Charge Enable**



- **Import Only Mode:**
  - **Enable AC Charge Enable, Disable Forced Discharge Enable and Enable PV Sell to Grid(Comp.W/Nem3.0)**



- **No Exchange Mode:**
  - **Disable both Forced Discharge Enable and AC Charge Enable, Enable PV Sell to Grid(Comp.W/Nem3.0)**



5. CONCLUSION

EG4 inverters set a high bar for grid compatibility by mastering all four operational modes defined by UL 1741 CRD-PCS and by offering advanced export/import limiting features. Their ability to seamlessly adapt to various grid scenarios and contribute to overall grid stability underscores their value in the evolving DER landscape. For customers, particularly those in states with strict regulations like California, this compliance ensures seamless grid interaction, saves on costly system upgrades, and future-proofs investment.

As DER and ESS become more widespread and the world moves towards decentralized energy solutions, EG4's commitment to grid cooperation and compliance will help shape a brighter energy future.