DISCOVER ENERGY SYSTEMS

TECHNICAL SERVICE BULLETIN

PV EXPORT CURTAILMENT w/SOL-ARK

CSB Number	855-0019 REV B
Date	July 29, 2025

URGENCY

- ○ **HIGH:** Action immediately
- ○ **MEDIUM:** Action when possible
- ● **LOW:** Action if necessary
- ○ **INFORMATION ONLY**

Action when PV export curtailment is observed in Sol-Ark (low voltage) grid-tied systems (non-hazardous condition).

PRODUCTS AFFECTED

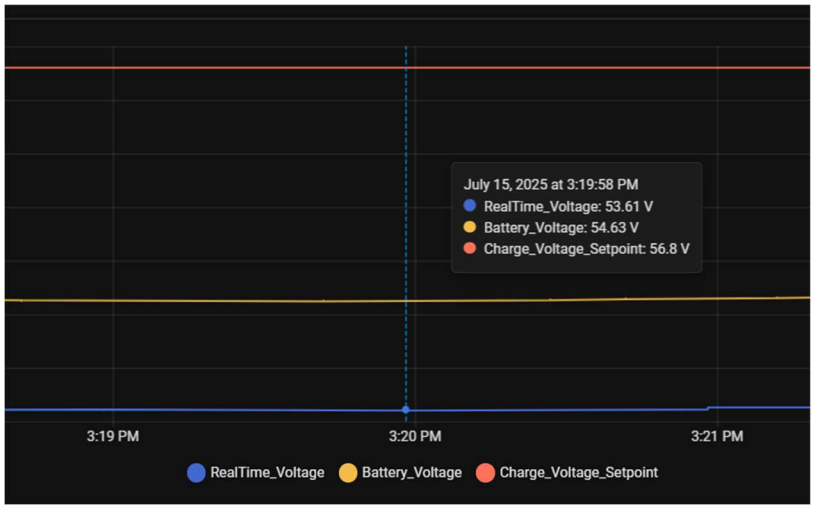
Discover lithium batteries using closed loop communications with Sol-Ark inverters operating in grid-tied export-enabled configurations, particularly when configured under certain grid profiles (such as IEEE 1547, Rule 21, or Hawaiian Electric modes), may experience undesirable PV curtailment due to inverter-specific logic related to PV export priority and battery charge regulation.

SYMPTOM OBSERVED

Premature PV curtailment occurs during battery charging. Instead of exporting excess solar power to the grid, the Sol-Ark inverter reduces PV output, limiting overall solar utilization and reducing grid export performance.

POSSIBLE CAUSE

Sol-Ark inverters can exhibit limited precision in voltage monitoring and do not rely on the BMS-reported voltage for constant voltage (CV) charge regulation. In some cases, the inverter's internal voltage reading can be off by as much as 800 to 1000 mV compared to the actual BMS voltage. This discrepancy can cause the inverter to incorrectly detect an over-voltage condition during the CV charging, which promotes PV power curtailment in an attempt to reduce the battery DC Bus voltage.



RealTime_Voltage = BMS Closed Loop Voltage (and measured DC Bus Voltage)

Battery_Voltage = Sol-Ark Internal Voltage Sense

Charge_Voltage_Setpoint = Requested BMS Charge Voltage

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Additionally, the inverter's internal EMS logic struggles to transition smoothly between battery charging and grid export modes. This issue is especially apparent when operating under closed loop Dynamic Voltage control. In grid-tied export-enabled applications, the inverter may reduce PV output instead of redirecting it to the grid.

This behavior is most prominent when certain Sol-Ark configurations are active, such as specific grid codes (including Rule 21 and Hawaiian Electric), export enablement, and Discover closed-loop Dynamic Voltage control. In these cases, the Dynamic Voltage algorithm may not prompt the inverter to prioritize grid export, causing underutilization of available solar power.

To resolve this, Discover developed a Dynamic Current algorithm that minimizes and bypasses the effect of the inaccurate voltage calibration and ensures a clearer handoff from charging to grid export by tapering charge current based on the delta V between actual pack voltage and a BMS static voltage target.

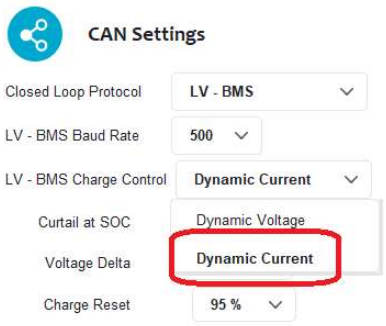
FIELD CORRECTIVE ACTIONS

Firmware Update:

- Update LYNK ACCESS to **v2.3.0.0** or later
- Ensure LYNK II firmware is updated to **v2.3.0.0** or later

Protocol Configuration:

- In LYNK ACCESS, under closed-loop settings, change inverter protocol from **"Sol-Ark"** to **"LV-BMS"**
- In the **LV-BMS** protocol settings, select **Dynamic Current** from the options listed in the **Charge Control Method** drop down list.
  Confirm the **LV - BMS Baud Rate** is set to **500** (default).



- The default Curtail at SOC and Voltage Delta values are sufficient for most applications. If you require advanced tuning of these values, please contact Technical Support to discuss your requirements https://discoverenergysys.com/contact/contact-technical-support
- Reset the inverter. Either:
  - Hold down both the ESC and ENTER buttons for 10 seconds to restart the display, or
  - Power down the inverter and power it back up.

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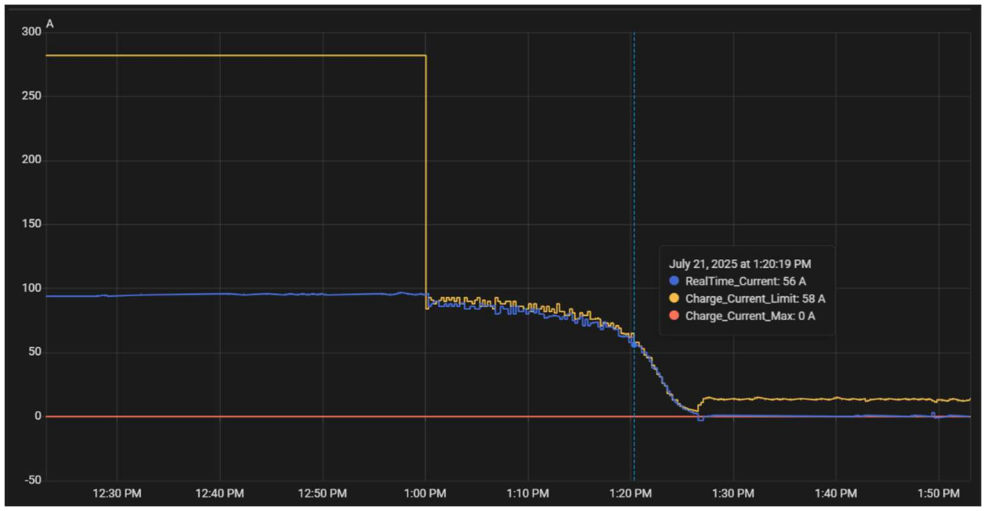
SUPPLEMENTARY INFORMATION

FEATURE SUMMARY

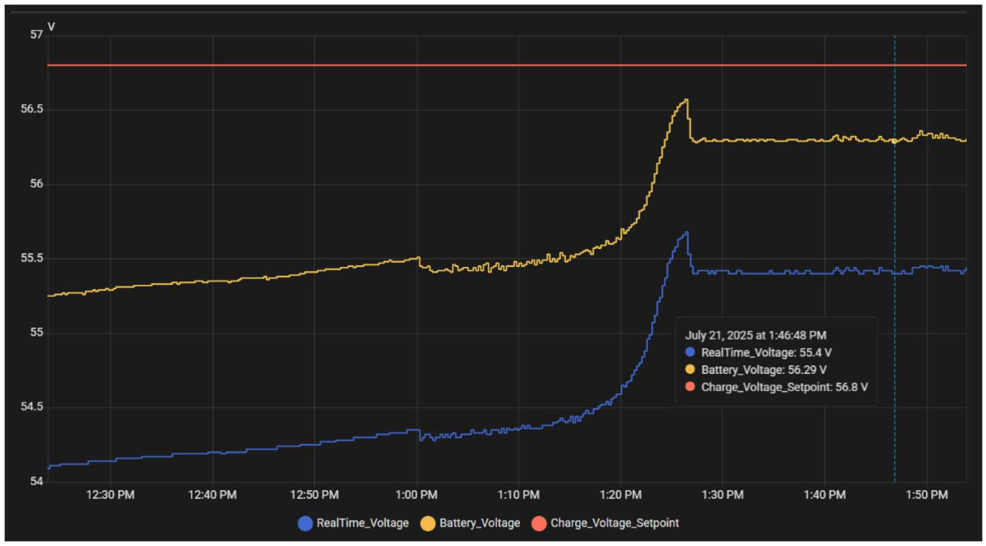
Dynamic Current Algorithm Behavior:

- Charge current begins tapering down once **SOC reaches ~90%**
- Current tapering curve begins at **2000mV delta** below CV target
- Uses **exponential decay** to ramp down charge current toward zero
- Once current reaches zero, the **charge enable flag is disabled**, prompting Sol-Ark to divert all available PV to load and grid export



Defined Voltage Values:

- **CV Goal Voltage (BMS Static Voltage Target):** 55.9 VDC
- **CV Charge Voltage (Elevated Charge Value):** 56.8 VDC



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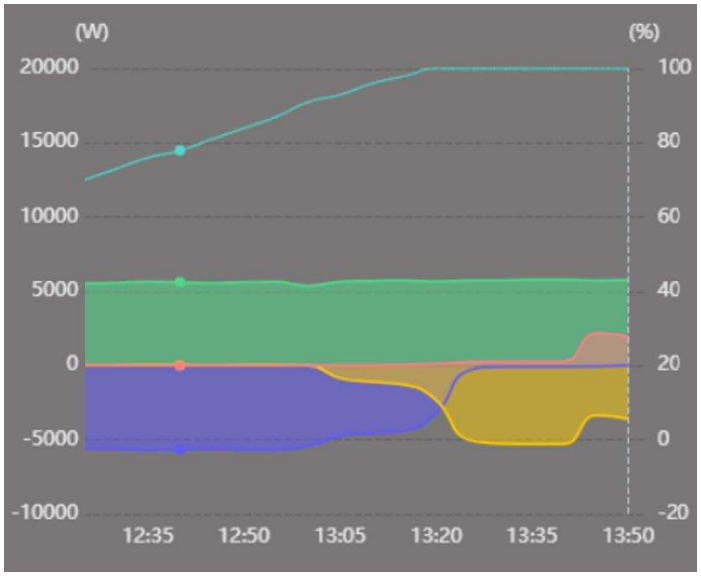
APPLICATION GUIDANCE

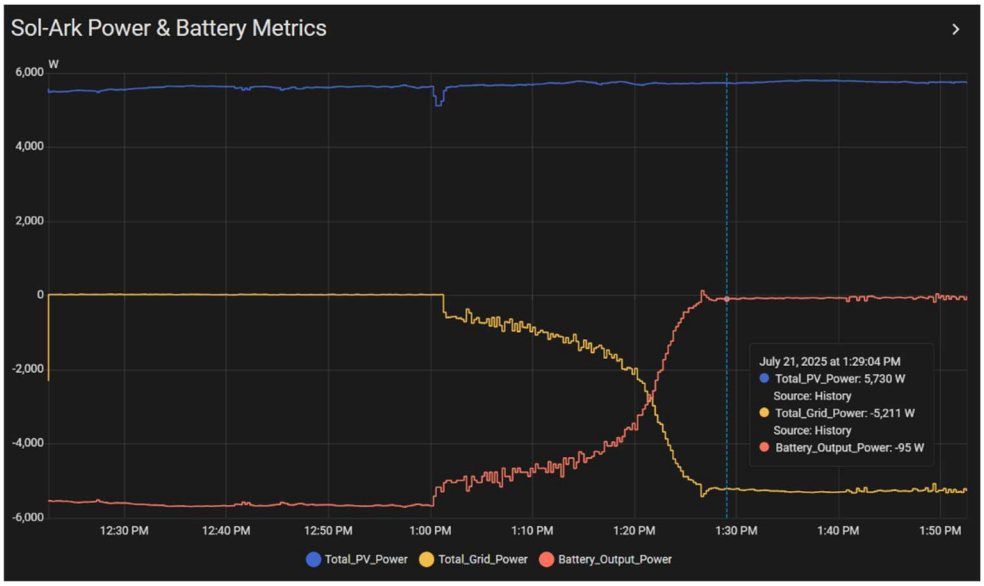
Recommended Use of Each Algorithm:

Mode	Best For	Notes
Dynamic Voltage	Zero export, Off-grid	Optimal balancing, tight DC bus control
Dynamic Current	Grid-tied with PV export	Prioritizes grid export; accommodates inverter transition delays

POST-CORRECTION BEHAVIOR

- PV curtailment due to CV misalignment is eliminated
- Sol-Ark inverter properly transitions from charge to export mode
- Charging resumes when SOC drops below 95%





ADDITIONAL RESOURCES

- **Documentation, firmware, and software downloads:** https://discoverenergysys.com/support/resources
- **Contact Technical Support:** https://discoverenergysys.com/contact/contact-technical-support

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