# Slenergy Intelligent Load Management

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# **Maximizing Self-Consumption**

### Why should we include load management in the energy storage system?

As more and more countries start limiting excess PV energy to feed into the power grid for grid stability purposes. A series of actions have been taken globally to stop people from exporting power to the grid, such as zero export limitations and negative electricity prices. So where does the excess PV power go if it's not allowed to export to the grid? The question of how to intelligently integrate our high-power household appliances into a solar energy management system to maximize the utilization of excess PV power and increase self-consumption for energy cost saving is a new one in the PV industry.

Thanks to the hard work of Slenergy team, the newly developed firmware and App can now integrate the heat pump which supports SG Ready function into the energy storage system for intelligent controlling the heat pump and maximizing electricity self-sufficiency.

#### INTRODUCTION



## Load management definition & advantages

#### MY HOME

Load management means the inverter can be used as a smart home energyDefinition management unit to manage the heat pump and smart loads for maximizing energy self-sufficiency and electricity bill saving.

Devices

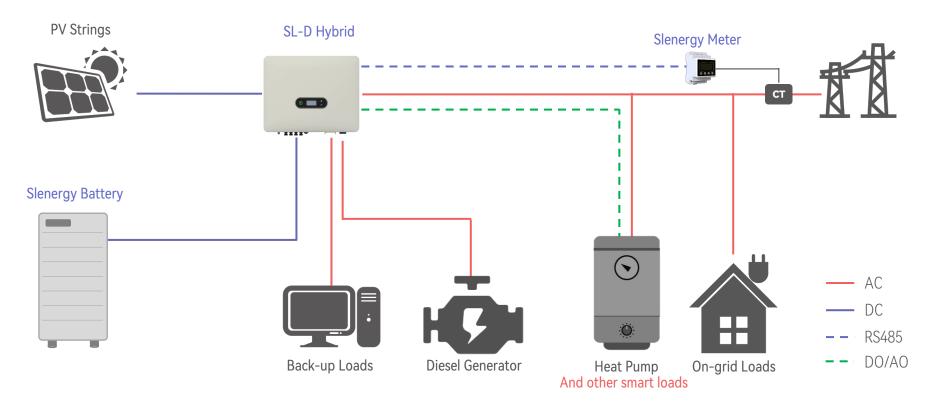
### FOR 100% ENERGY INDEPENDENCE

### Key Advantages

- Maximize the utilization of PV energy and avoid energy waste
- Improve energy self-sufficiency and green energy utilization
- Save electricity bills by shifting energy peaks

Intelligently manage the heat pump working status according to your preference or the excess PV power and SOC.

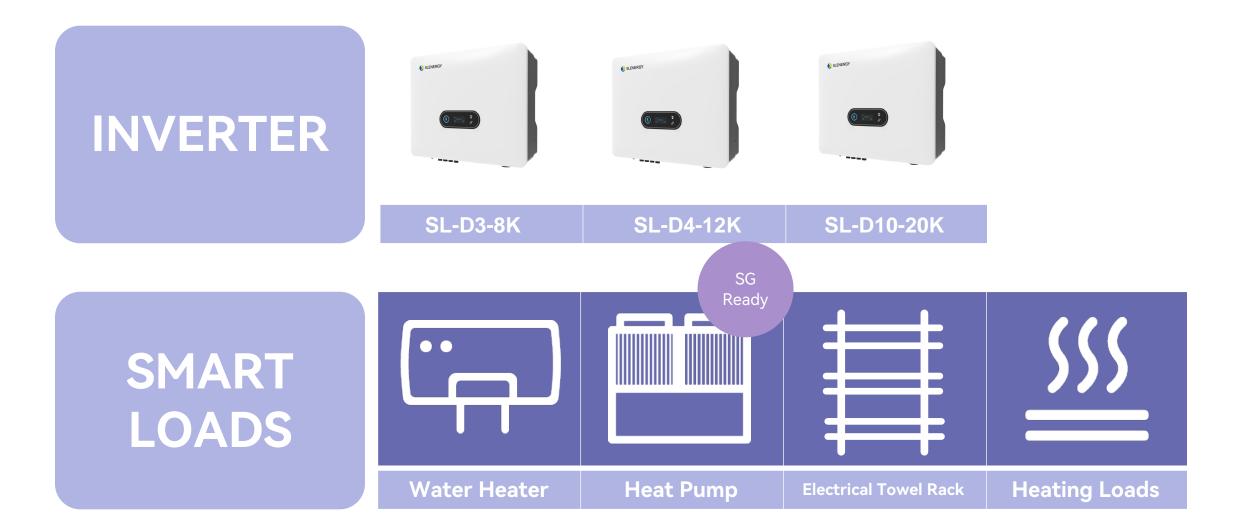
## **Slenergy load management solution**



### **Energy priority**

- A. Power from PV will first supply back-up and on-grid loads
- B. Charge the battery if there's surplus power after the loads are satisfied
- C. Excess power to supply smart loads such as the heat pump or water heater for optimizing energy utilization.

### Load management compatibility



## Heat pump SG ready introduction

Combination Situation	1	2	3	4	
SG	ON/1	OFF/0	OFF/0	ON/1	
SG-C		OFF70	OFF70		
EUV	OFF/0	OFF/0	ON/1	ON/1	
EUV-C	OFF70	OFF70			
Meaning	Peak hour	Regular hour	Valley hour	Free/PV power	
Control	Heat pump turn off 2hours in every 24hours	Heat pump operation according to preset value	Heat pump runs within the controller in boosted operation for space heating and domestic hot water preparation	Heat pump and electric heater operate together, heat pump will return to the original mode when the tank temperature reaches 75 Celsius	

## Work Modes

### Disable

Disable means not using the load management function.

#### Smart Mode

A. Feed-in Power Control--- use in system WITHOUT power export limitation. Set the feed-in power threshold for triggering the heat pump entering Mode3 or turn on smart load. When the meter detects the feed-in power equal to or greater than the set value, heat pump will enter heating mode or smart loads start working.

#### B. Battery SOC Control--- use in system WITH power export limitation.

Set the battery SOC threshold for triggering the heat pump entering Mode3 or turn on smart load. When inverter detects the battery SOC value equal to or greater than the set value, pump will enter heating mode or smart loads start working.

#### C. Time Control

Set the operation periods for heat pump Mode3 or smart load according to user habits or preferences. Up to 3 periods can be set. When this mode is enabled, a higher priority than other modes within the period. Outside the period, the heat pump or smart load operates according to the parameters set by the smart mode.

#### Manual Mode

Manually control the heat pump entering Mode3 or starting the smart load.

### Three modes for flexible load management

**V** Disable



Manual Mode

## **Disable & Manual mode**

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Parameter Settings	¢	← Loa	d Management		Load Manage	ment	– Load Mana	agement
Configuration Wizard			ans the inverter can be used as a smart		Load Management		Load Management	
Grid Parameters			ent unit to manage the heat pump and ing energy self-sufficiency and		home energy management unit to manag smart loads for maximizing energy self-su electricity bill saving.		home energy management unit to n smart loads for maximizing energy s electricity bill saving.	
Power Control					Switch Status Heat pump exit Mode3 or turn off smart le	oad.	Switch Status Heat pump enter Mode3 or turn on	smart load.
Protection Parameters								
Feature Parameters								
Battery Parameters								
Load Management								
Meter Checking								
Maintenance					Cancel	Yes		
Device Log					Disable			
			Confirm		SmartMode	•	Confi	rm
Disclaimers					ManualMode	e		

### Smart mode

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– Load Managem	ent	۷.	Time Control
Load Management		01:0	0 - 04:00
home energy management unit to manage smart loads for maximizing energy self-su electricity bill saving.		04:2	5 - 08:15
Feed-in Power Control			
Set the feed-in power threshold for triggerin entering Mode3 or turn on smart load. Wher detects the feed-in power equal to or greate	the meter	•	15:05 - 20:45
value, inverter relay will close and heat pu heating mode or smart loads start working is suggested to use in the system without limitation.	o will enter This control mode	Star	t Time
		End	Time
Battery SOC Control			
Set the battery SOC threshold for triggering entering Mode3 or turn on smart load. Wher the battery SOC value equal to or greater th inverter relay will close and heat pump will e mode or smart loads start working. This con suggested to use in the system with power of	n inverter detects an the set value, nter heating trol mode is		Save
Time Control Set the operation periods for heat pump mo load according to user habits or preferences can be set. When this mode is enabled, a hig other modes within the period. Outside the pump or smart load operates according to th by the smart mode. If this mode is not enabl set, it operates according to the parameters mode throughout the day.	. Up to 3 periods her priority than period, the heat ne parameters set ed or no period is		
Confirm			

	Load management means the inverter can be used home energy management unit to manage the hea smart loads for maximizing energy self-sufficiency electricity bill saving.	t pump and
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>	detects the feed-in power equal to or greater than value, inverter relay will close and heat pump will e heating mode or smart loads start working. This co is suggested to use in the system without power ex limitation.	the set nter ntrol mode
>	Feed-in Power Threshold	1000 w >
~	Minimum Operation Time	30 min $>$
5:05 💌	Daily Max Operation Hours	<b>280</b> min >
0:45 💌	Consumption Power Threshold	280 w >
0.45	End SOC Threshold	30 % >
	Battery SOC Control	0
	Set the battery SOC threshold for triggering the he entering Mode3 or turn on smart load. When invert the battery SOC value equal to or greater than the inverter relay will close and heat pump will enter he mode or smart loads start working. This control mo suggested to use in the system with power export	ter detects set value, eating ide is

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Load Management

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#### Time Control

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Confirm

Load Management Load Management SmartMode Load management means the inverter can be used as a smart home energy management unit to manage the heat pump and smart loads for maximizing energy self-sufficiency and electricity bill saving. Feed-in Power Control Set the feed-in power threshold for triggering the heat pump entering Mode3 or turn on smart load. When the meter detects the feed-in power equal to or greater than the set value, inverter relay will close and heat pump will enter heating mode or smart loads start working. This control mode is suggested to use in the system without power export limitation. Battery SOC Control Set the battery SOC threshold for triggering the heat pump entering Mode3 or turn on smart load. When inverter detects the battery SOC value equal to or greater than the set value, inverter relay will close and heat pump will enter heating mode or smart loads start working. This control mode is suggested to use in the system with power export limitation. Start SOC Threshold 80 % > Minimum Operation Time 30 min > Daily Max Operation Hours 280 min > **Consumption Power Threshold** 280 w > End SOC Threshold 30 % Time Control

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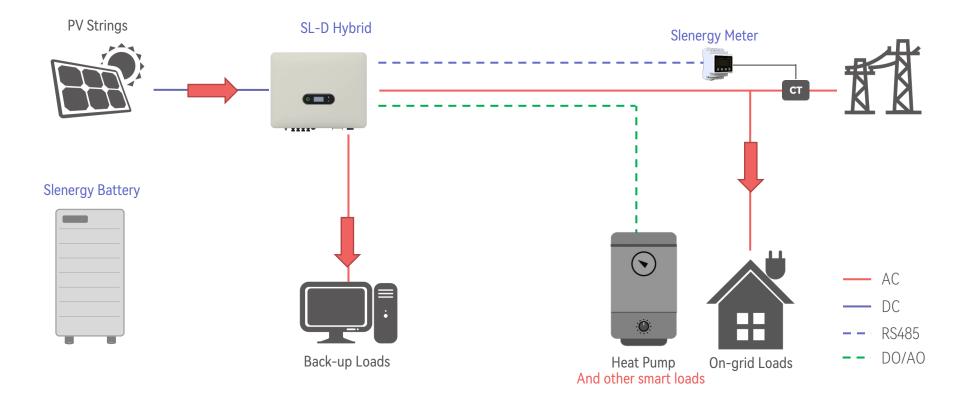
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SmartMode

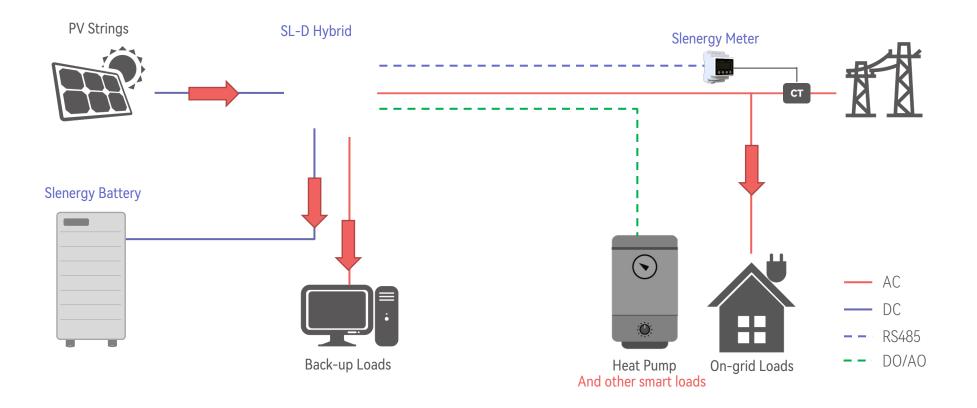
Load Management

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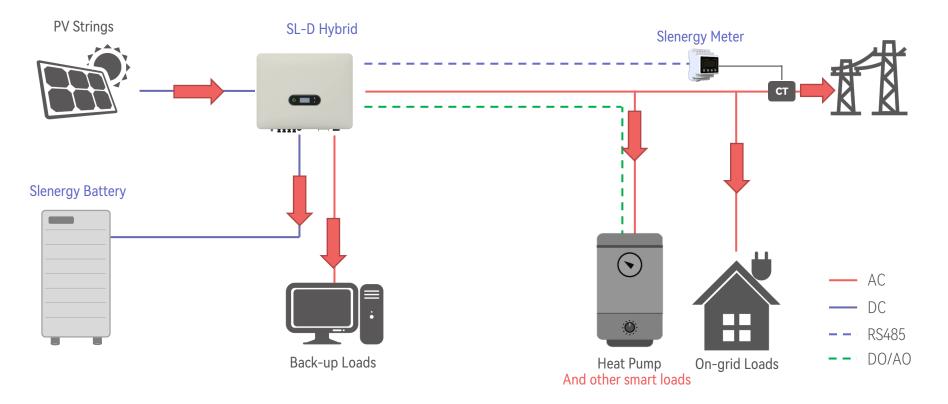
6: 00-9:00 am

Inverter starts to convert power from PV to supply house loads consumption



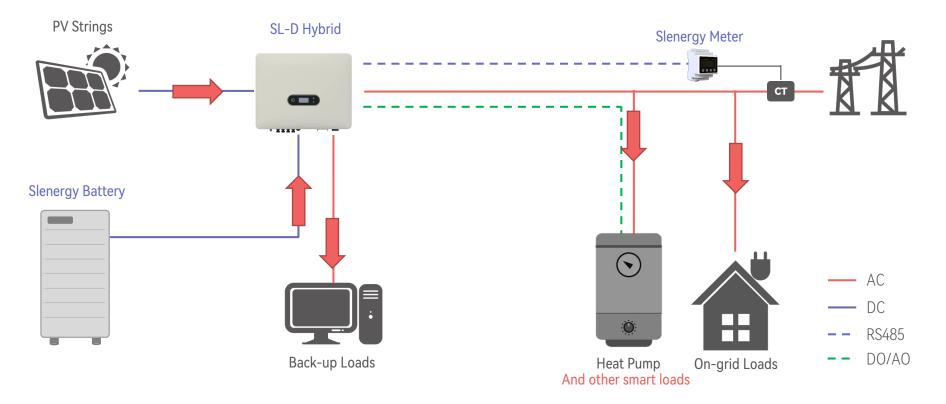
9: 00-13:00 pm

PV generates more power and loads become lower, excess power will charge the battery.



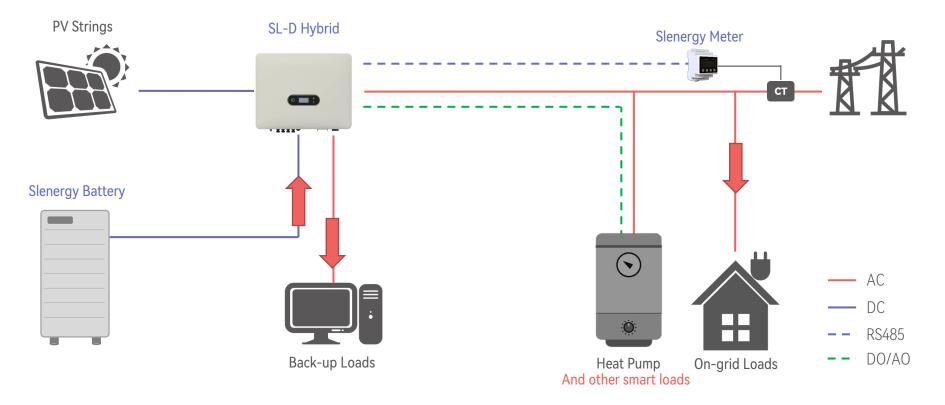
#### 13: 00-17:00 pm

After the battery is fully charged, surplus power will export to the grid for FIT but if there's no FIT or the power export limit is required, the excess power will be used to heat the heat pump water or support other smart loads.



#### 17: 00-19:00 pm

PV generation gets lower, and the battery starts discharging power to support loads and the heat pump. when the battery SOC drops to the preset value, the battery will stop providing power to the heat pump or smart loads.



19: 00-22:00 pm

No more PV generation and the battery with relatively low SOC can be used to light up the house and people can enjoy the hot water heated up during the day for showering or keeping the house warm.

# **THANK YOU**

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