

Monitor System Setting Introduction For Hybrid Inverter

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History

Version	Record of modification	Date
Initial version	Initial version	2022-12-16

This Document is used to give a explanation of settings in the website and APP to Lux Power customers for [Hybrid Inverter LXP-US 12K](#). The monitor system may change anytime, so if you find the settings described below is different from what you see, you can contact info@luxpowertek.com for help.

Content

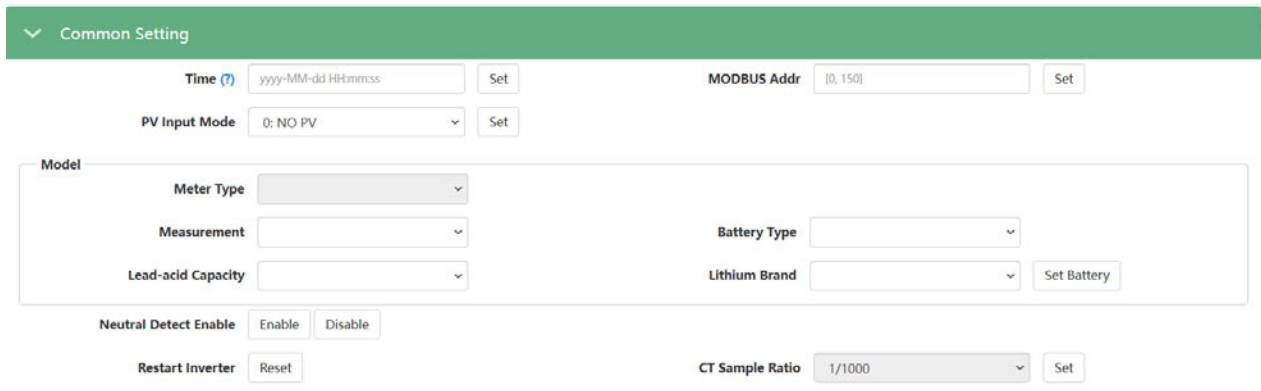
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SETTING EXPLANATION

1. Common Setting



The screenshot shows the 'Common Setting' interface with the following fields and controls:

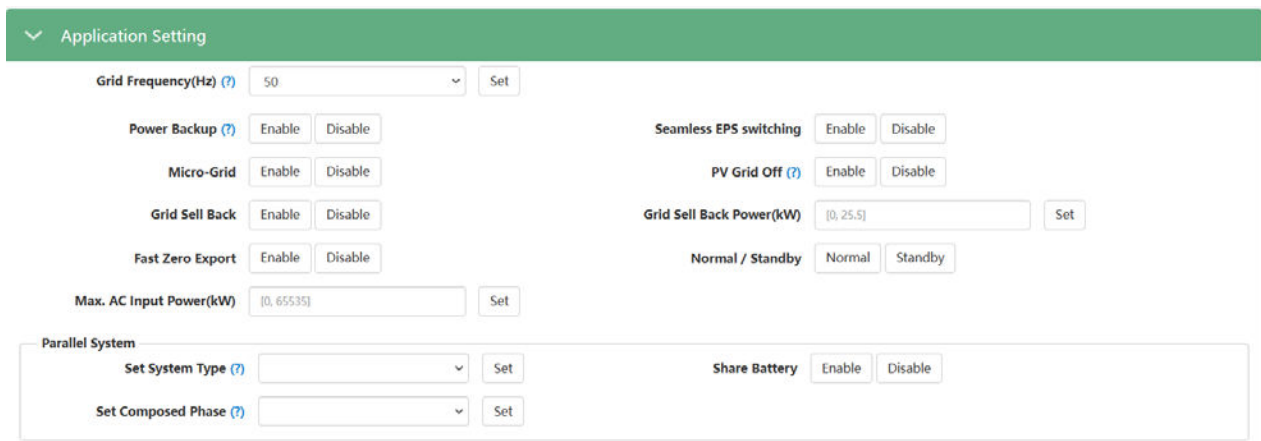
- Time (?)**: Input field with format 'yyyy-MM-dd HH:mm:ss' and a 'Set' button.
- MODBUS Addr**: Input field with range '[0, 150]' and a 'Set' button.
- PV Input Mode**: Dropdown menu with '0: NO PV' and a 'Set' button.
- Model** group:
 - Meter Type**: Dropdown menu.
 - Measurement**: Dropdown menu.
 - Lead-acid Capacity**: Dropdown menu.
 - Battery Type**: Dropdown menu.
 - Lithium Brand**: Dropdown menu with a 'Set Battery' button.
- Neutral Detect Enable**: Toggle buttons for 'Enable' and 'Disable'.
- Restart Inverter**: 'Reset' button.
- CT Sample Ratio**: Dropdown menu with '1/1000' and a 'Set' button.

- ❖ **Time** : Local time of the inverter, the input format is 2019-02-14 14:44:00. Format yyyy-MM-dd HH:mm:ss
 - ❖ **Modbus Addr** : Communication COM address in 485 communication system. If you installed more than one inverter in the field and use a 485 bus to communicate, you need to set the inverters to different address. The range is from 0 to 150
 - ❖ **PV Input Mode**: The connection way of solar module
- When you need to change the settings in "Model" set group, you need to set inverter to "Standby" first, and then press "set battery" to change the model.
- ❖ **Battery Type, Lead-acid Capacity, Lithium Brand**: Choose the battery type and then battery brand for Lithium battery or battery capacity for lead-acid. Please note after set the battery, all other settings will be set to default.
 - ❖ **Neutral Detect Enable** Detect if the customer has connect the neutral line in AC terminal.
 - ❖ **Measurement, Meter Type, CT Sample Ratio** Choose the correct measurement, meter type or CT sample Ratio according to the external measuring device you installed. The default measurement is CT with sample ratio :1000/1, and you can change the

measurement if you have installed a meter to the inverter.

- ❖ **Restart Inverter:** Restart inverter remotely

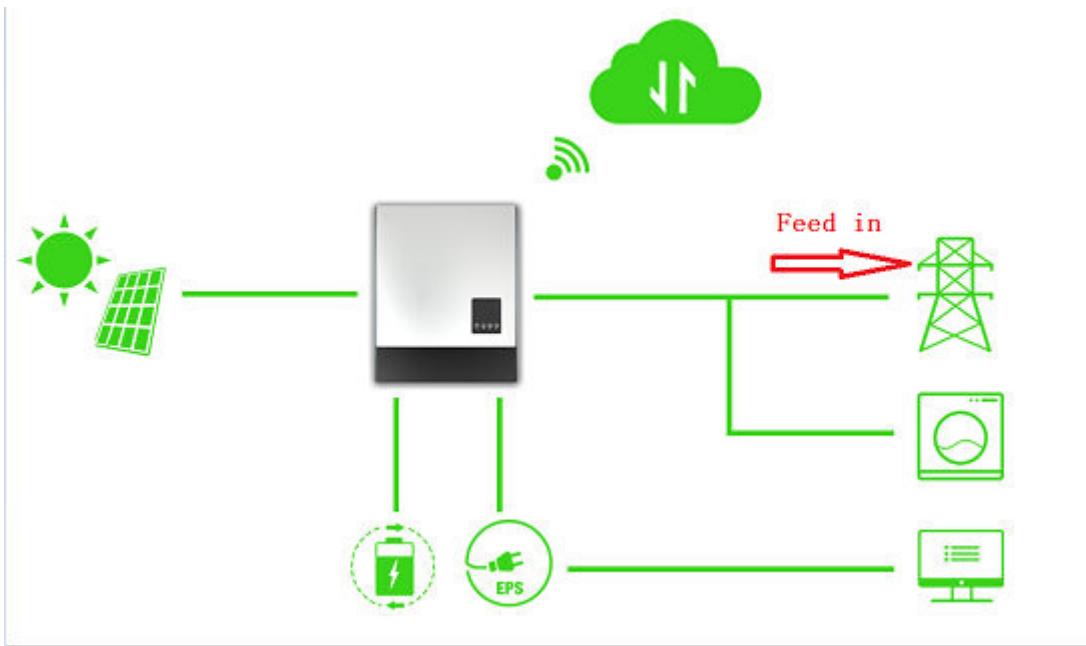
2. Application Setting



- ❖ **Grid Frequency (Hz)** : If the grid frequency is nominal 50Hz , then the EPS Frequency will be adjusted to 50Hz automatically ; If there is no grid power , and it is read as 50Hz ,but the devices are 60Hz,then you can set to 60Hz manually. This is based on the rated frequency of the local grid regulation and devices.
- ❖ **Power Backup** : If Power backup function is Enabled, the EPS/UPS terminal will keep output when AC interrupted. You can set" Power backup" by web or "Off-grid output" by LCD. (Enable this mode, EPS output will be uninterrupted)
- ❖ **Seamless EPS Switch:** When power interrupted, the inverter will turn to EPS mode seamlessly. But if there is grid voltage fluctuation issue ,we suggest you disable it to avoid misjudgment.
- ❖ **Micro-Grid** : If the inverter is connected to AC generator with the AC terminals, we need to set Micro-Grid Enable. In this situation, the system will not feed into generator and

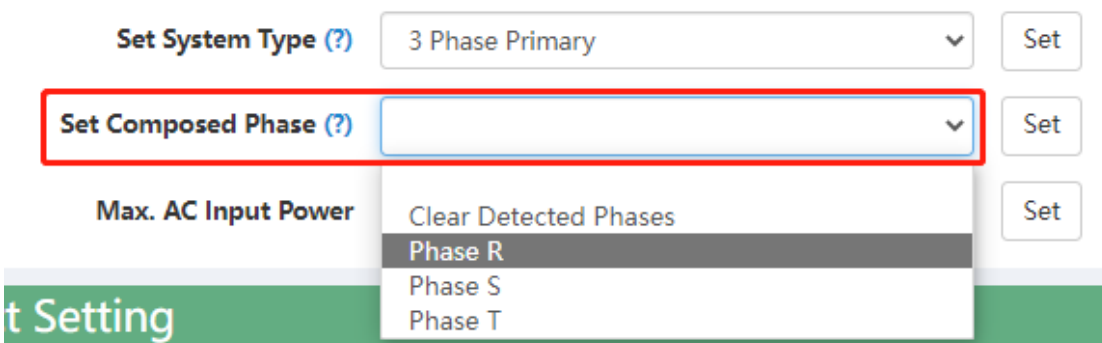
whenever there is output of generator. The inverter will use the generator power to charge the battery. The frequency range will also be enlarged to compatible with the generator.

- ❖ **PV Grid Off** : If the customer want the system have off-grid function without install any battery, please enable PV Grid Off. Please note in this situation, the off-grid energy is supplied by solar, it is not stable. We suggest the customer to install battery to keep the EPS/UPS output voltage stable if they want to have off-grid function.(Allow to access the off grid mode when only solar input is available)
- ❖ **Grid sell back** : In some countries, the customer can not feed energy into grid, or if the customer do not want to feed energy to grid, you can disable Grid sell back function.



- ❖ **Grid Sell back Power (kW)**: If Grid sell back function is enabled, you can set the power limitation to feed into grid.
- ❖ **Fast Zero Export**: Normally inverter will adjust output power every 5 seconds to avoid export, if fast zero export enabled, the inverter will adjust output power fast.

- ❖ **Normal/Standby:** “Standby” is used to set the whole system to standby mode, stop feed in and charge, discharge; “Normal” is used to set the whole system to auto run status.
- ❖ **Max. AC Input Power:** If the inverter can adjust the charge power based on the detected EPS load consumption and Max.AC input power limitation .
- ❖ **Paralleling Setting Group**
 - **Set Subordinates or Primary :** LXP inverters support paralleling functions, you can connect the EPS terminal together in paralleling system, in this situation, we need to set one of the inverter to primary, and the others are slave. If you install all inverters in one phase, set one of the inverter to “1Phase Primary” ; If you want to compose three phase system, set one of the inverter to “3 Phase Primary” . All inverters are set to Subordinates in default mode, so when you get the inverters, just need to set one inverter to Primary.(Used for paralleling inverters)
 - **Set Composed Phase:** When you use equal or more than 3 inverters to compose a three phase system, you connect the AC terminals of inverter to three phase grid. (Used when compose a three phase)



Set System Type (?) 3 Phase Primary Set

Set Composed Phase (?) Set

Max. AC Input Power Clear Detected Phases Phase R Phase S Phase T Set

Paralleling Setting

- ◆ If there is utility in the filed, the inverter will detect the phase it connects to

automatically and record it. Next time it will output the phase as it detected.

- ◆ If the user setting is different from the phase inverter detected, it will output the phase it detected.
- ◆ The output phase record will be cleared if customer clears it.

Setting

Set System Type (?) 3 Phase Primary Set

Set Composed Phase (?) Clear Detected Phases Set

Max. AC Input Power Clear Detected Phases Set

Phase R

Phase S

Phase T

- ◆ If there is no utility for the whole time, it will use the user output phase setting to compose three phase output. If the customer set wrong phase, for example 2 R phase and no T phase, the system will report error.
- **Battery Shared:** For paralleling system, if all inverters connect to same battery, then we need to enable battery shared and then master inverter will broadcast the battery info to other inverters

3. Grid Connect Setting

Grid Connect Setting

Connection

Connect Time(s) [30, 600] Set

Reconnect Time(s) [0, 600] Set

Grid Volt Connect High(V) Set

Grid Volt Connect Low(V) Set

Grid Freq Connect High(Hz) Set

Grid Freq Connect Low(Hz) Set

Power Command

OVF Load Derate Enable

Reactive Power Type

Reactive Power Percent(%)

PF CMD

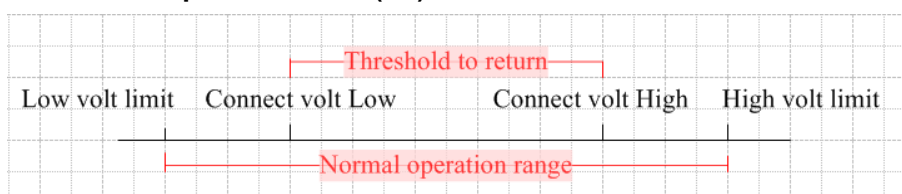
Active Power Percent(%)

Grid Soft Start

Grid Protection

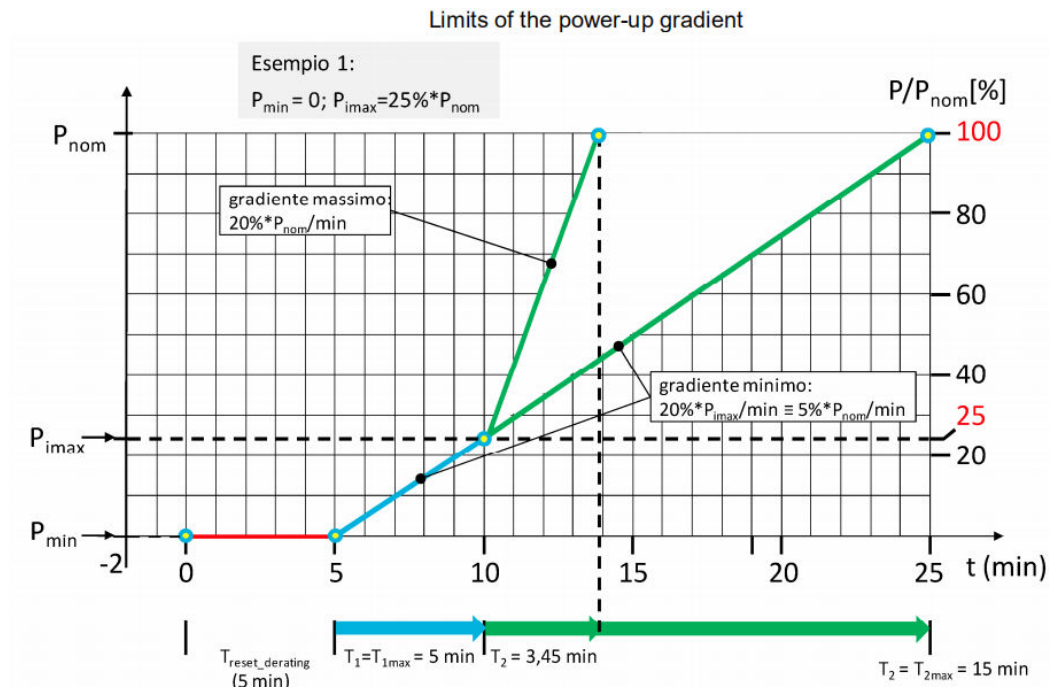
Grid Volt Limit1 Low(V)		Set	Grid Volt Limit2 Low(V)		Set	Grid Volt Limit3 Low(V)		Set
Grid Volt Limit1 High(V)		Set	Grid Volt Limit2 High(V)		Set	Grid Volt Limit3 High(V)		Set
Grid Freq Limit1 Low(Hz)		Set	Grid Freq Limit2 Low(Hz)		Set	Grid Freq Limit3 Low(Hz)		Set
Grid Freq Limit1 High(Hz)		Set	Grid Freq Limit2 High(Hz)		Set	Grid Freq Limit3 High(Hz)		Set
Grid Volt Mov Avg High(V)		Set	Power Soft Start Slope(%/min)	[1, 100]	Set			

- ❖ **Grid Regulation** : Select the correct Grid safety regulation to work
- ❖ **Grid Type** : Select the correct Grid type to work, such as split phase : 240/120, 220/110, 200/120 , or single phase: 220, 230,240
- ❖ **Connect Time** : the wait time to connect to grid if the solar input is ready and the utility is in range when power on.
- ❖ **Reconnect Time** : the inverter will reconnect to grid if the utility is in range after its abnormal situation. It will wait the setting time to reconnect
- ❖ **Grid Connect Condition Setting Group**: If the voltage and frequency is in range of belowing setting, the inverter will connect to grid
 - **Grid Volt Connect High(V)**
 - **Grid Volt Connect Low(V)**
 - **Grid Freq Connect High(Hz)**
 - **Grid Freq Connect Low(Hz)**

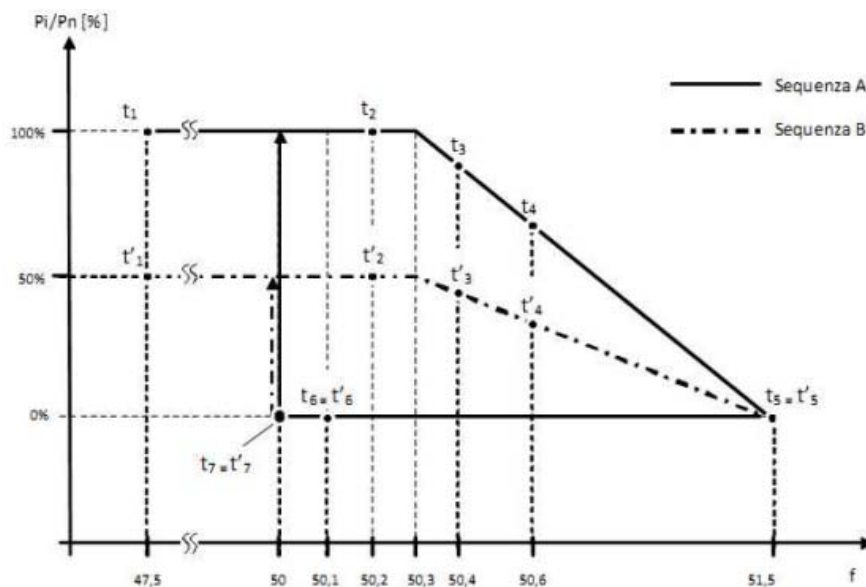


- ❖ **Active Power Percent (%)** Max AC output power percent of the inverter

- ❖ **Grid Soft Start** If enabled, inverter will output AC power slowly.



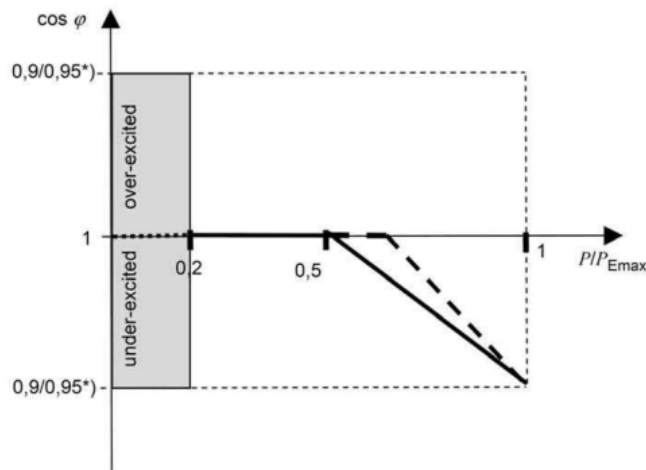
- ❖ **OVF Load Derate Enable** If the frequency is higher than 50.2/60.2Hz, the output power will derate the output power as the curve.



❖ Reactive Power CMD Type

- 0-Unit power factor: the inverter only output active power, PF =1
- 1-Fixed power factor: the inverter output power with a fixed PF
- 2-Default $\cos\phi(P)$: the PF is decided by the output active power

Characteristic curve $\cos\phi(P)$



- 4-UnerReactivePower: the inverter will output under-excited reactive power
- 5-OverReactivePower: the inverter will output over-excited reactive power
- 6-Q(V): the inverter will output reactive power according to the AC voltage

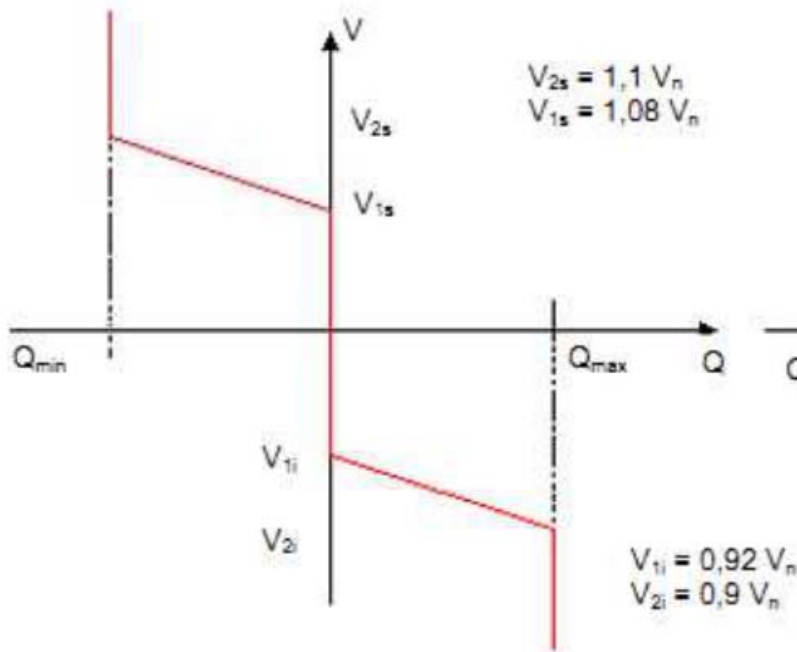


Figura a

- ❖ **Reactive Power Percent CMD(%)**: This command is combined used with Reactive Power CMD Type, If you set 4-UnderReactivePower or 5-OverReactivePower, you can set the output reactive power percent here.

Grid Protection		
Grid Volt Limit1 Low(V)		Set
Grid Volt Limit1 High(V)		Set
Grid Freq Limit1 Low(Hz)		Set
Grid Freq Limit1 High(Hz)		Set
Grid Volt Mov Avg High(V)		Set
Grid Volt Limit2 Low(V)		Set
Grid Volt Limit2 High(V)		Set
Grid Freq Limit2 Low(Hz)		Set
Grid Freq Limit2 High(Hz)		Set
Power Soft Start Slope(%/min)	[1, 100]	Set
Grid Volt Limit3 Low(V)		Set
Grid Volt Limit3 High(V)		Set
Grid Freq Limit3 Low(Hz)		Set
Grid Freq Limit3 High(Hz)		Set

- ❖ **Grid Protection Setting Group**: If the AC voltage/frequency is lower than low limit, or higher than high limit, the inverter will disconnect from the grid. Note keep Grid Volt/Freq Limit3 Low(V) <= Grid Volt/Freq Limit2 Low(V) <= Grid Volt/Freq Limit1 Low(V) ; Grid Volt/Freq Limit3 High(V) >= Grid Volt/Freq Limit2 High(V) >= Grid Volt/Freq Limit1 High(V)
- **Grid Volt Limit1 Low(V)**
- **Grid Volt Limit2 Low(V)**
- **Grid Volt Limit3 Low(V):**
- **Grid Volt Limit1 High(V)**

- Grid Volt Limit2 High(V)
- Grid Volt Limit3 High(V)
- Grid Freq Limit1 Low(Hz)
- Grid Freq Limit2 Low(Hz)
- Grid Freq Limit3 Low(Hz)
- Grid Freq Limit1 High(Hz)
- Grid Freq Limit2 High(Hz)
- Grid Freq Limit3 High(Hz)

- ❖ **Grid Volt Mov Avg High(V):** If average AC voltage for 10 minutes is higher than the set value, the inverter will disconnect from the grid.
- ❖ **Grid on Power SS Enable,Power Soft Start Slope(%/min):** The inverter output power increase speed when connect to grid at the beginning.If you need to change the power soft start slope ,just leave the“ Grid on Power SS” enable.

4. Advanced Setting

Advanced Setting

PV Arc

Enable

Disable

CT Direction Reversed

Enable

Disable

RSD Disable

Enable

Disable

AC Couple

Enable

Disable

PV Arc Fault Clear

Clear

Smart Load Enable

Enable

Disable

Batt Capacity(Ah)

[50, 1500]

Set

CT Power Offset(W)

[-1000, 1000]

Set

- ❖ **PV Arc :** Only available for US model, and the inverter will detect when there is PV input arc fault and protect the PV input from arc fault.
- ❖ **PV Arc Fault Clear :** Clear the record of PV Arc fault.
- ❖ **CT Direction Reversed :** The CT clamp should be installer to the Live line with its arrow pointing to the inverter . But if you have installed the CT in wrong direction and have left the site , you can also set “CT direction reversed” enable via web page.
- ❖ **Smart load :** If there isn’ t generator installation at the GEN Input port and a smart load to

work is required , you can connect the load to GEN port and also you can configure the smart load settings under discharge menu.

- ❖ **RSD** : This function is only available for US model , and it is the rapid shut-down detection of the PV inputs.
- ❖ **Battery Capacity (Ah)** : Installed Lead-acid battery capacity .
- ❖ **AC couple** : When there is existing PV inverter in this system ,and you need it to work in both on-grid and off-grid mode , you can connect the AC output of the PV inverter to the GEN port and enable AC couple function , and also need to configure more AC couple settings under charge menu .
- ❖ **CT power offset** : The CT has sampling error around 100W, and sometimes the inverter said it is 0W in monitoring page , but the meter at the grid side shows import or export , then you can adjust the CT offset , if you input 50 , that means inverter will export more 50W to compensate the load consumption , and if you input -50 , that means inverter will reduce 50W of export power to compensate the load consumption.

5. Generator Setting



- ❖ **Batt Charge current limitation(A)** : Battery charge current limitation from Generator .
- ❖ **Gen Rated Power (kW)** : Generator input power limitation, you can limit the battery charge power based on the detected EPS load consumption and Generator input power limitation .

Charge Setting

Charge Last

Enable

Disable

Charge Current Limit(A)

[0, 250]

Set

Batt Charge Control

Volt

SOC

AC Charge

AC Charge Enable

Enable

Disable

Stop AC Charge SOC(%)

[0, 100]

Set

AC Charge Start Time 1

[0, 23]

:

[0, 59]

Set

AC Charge End Time 1

[0, 23]

:

[0, 59]

Set

AC Charge Power(kW)

[0, 25.5]

Set

Stop AC Charge Volt(V)

[48, 59]

Set

AC Charge Start Time 2

[0, 23]

:

[0, 59]

Set

AC Charge End Time 2

[0, 23]

:

[0, 59]

Set

AC Charge Start Time 3

[0, 23]

:

[0, 59]

Set

AC Charge End Time 3

[0, 23]

:

[0, 59]

Set

Charge Priority

Charge First(PV) (?)

Enable

Disable

Stop Charge First SOC(%) (?)

[0, 100]

Set

Charge First Start Time 1

[0, 23]

:

[0, 59]

Set

Charge First End Time 1

[0, 23]

:

[0, 59]

Set

Charge First Power(kW)

[0, 25.5]

Set

Stop Charge First Volt(V)

[48, 59]

Set

Charge First Start Time 2

[0, 23]

:

[0, 59]

Set

Charge First End Time 2

[0, 23]

:

[0, 59]

Set

Charge First Start Time 3

[0, 23]

:

[0, 59]

Set

Charge First End Time 3

[0, 23]

:

[0, 59]

Set

Lead-acid Battery Setting

Absorb Voltage(V)

[50, 59]

Set

Float Voltage(V)

[50, 59]

Set

Charge Temperature Low Limit(°C)

[0, 100]

Set

Charge Temperature High Limit(°C)

[0, 100]

Set

- ❖ **Charge Last** : The PV power will not be used to charge the battery until the export power to the grid reaching the limitation.(PV to Load > PV to grid > PV to battery).
- ❖ **Charge current limit (A)** : The max. Charge current limitation of the whole system.
- ❖ **Battery Charge Control** : If the inverter works with the Lithium battery battery and communication is also compatible , then you can just select charge control according to "SOC" , else if the inverter works with lead-acid battery or the lithium without

communication , you can select charge control according to "VOLT" .

- ❖ **AC Charge Enable:** if the customer want to use AC charge the battery, the customer need to (1) enable " AC charge Enable" , and then (2)set the max power he want to charge the battery from AC, (3)set the SOC Limit (4)set the time period he wants to use the AC to charge the battery, there are 3 time periods you can set. So if the battery SOC is less than the limit, the system will use AC to charge the battery during the time he set

- **AC Charge Enable**

- **AC Charge Power (kW):** The max charge power from grid.

- **Stop AC Charge SOC(%)/ Volt(V)** If the battery SOC or Voltage is higher than limit, the inverter will stop AC charging

- **AC Charge Start Time 1**

- **AC Charge End Time 1**

- **AC Charge Start Time 2**

- **AC Charge End Time 2**

- **AC Charge Start Time 3**

- **AC Charge End Time 3**

If the time setting is continuous ,like 19:00(night time) - 08:00(morning of next day) ,you can just set 1 time slot .

- ❖ **Charge First(PV) Setting Group :**For LXP hybrid inverter, in default mode, when PV power is sufficient to cover the demands of home loads, then PV power will firstly consumed by home loads, if there is excessive PV power then the excessive power will be used to charge the battery, if there is still PV power rested after load consuming and battery charging, then the rested PV power will be feed-in to the grid. In some situation, the customers want the solar power to charge battery first, and if there is more energy, it take the load in house. So we can enable charge first function. Charge first power CMD is the max power percent when charge battery in charge first mode. If the time is in the period user set and the

battery SOC is less than the limit, the solar power will be used to charge battery first.

- **Charge Priority**(Enable this mode, solar power charge battery first, then take the family load, if there is surplus, feed into grid)
- **Charge First Power(kW)** The max charge power from PV.
- **Stop Charge first SOC(%)/ Volt(V)** If the SOC is higher than limit SOC or Voltage, the inverter will stop charge first function
- **Charge First Start Time 1**
- **Charge First End Time 1**
- **Charge First Start Time2**
- **Charge First End Time2**
- **Charge First Start Time 3**
- **Charge First End Time3**

❖ **Lead-Acid Battery Setting Group**

- **Absorb Voltage (V)** : The max. charge voltage limit
- **Floating Voltage (V)** : The float charge voltage for Lead-Acid Battery, it should be lower than or equal to the Absorb voltage.
- **Charge Temperature Low Limit** : If the temperature is lower than low limit, the inverter will stop charge battery (Only available for AS 4777 grid regulation)
- **Charge Temperature High Limit** : If the temperature is higher than high limit, the inverter will stop charge battery (Only available for AS 4777 grid regulation)

7. Discharge Setting

Discharge Setting

System Discharge Power Rate(%) (?) [0, 100] Set
On-Grid Cut-Off SOC(%) (?) [0, 90] Set
Off-Grid Cut-Off SOC(%) (?) [0, 90] Set

Batt Discharge Control Volt SOC
On-Grid Cut-Off Volt(V) (?) [40, 56] Set
Off-Grid Cut-Off Volt(V) (?) [40, 52] Set

Discharge Current Limit(Adc) (?) [0, 250] Set
Start Discharge P_import(W) [50,] Set

Forced Discharge

Forced Discharge Enable Enable Disable
Forced Discharge Power(kW) [0, 25.5] Set

Stop Discharge SOC(%) [0, 100] Set
Stop Discharge Volt(V) [40, 56] Set

Forced Discharge Start Time 1 [0, 23] : [0, 59] Set
Forced Discharge Start Time 2 [0, 23] : [0, 59] Set
Forced Discharge Start Time 3 [0, 23] : [0, 59] Set

Forced Discharge End Time 1 [0, 23] : [0, 59] Set
Forced Discharge End Time 2 [0, 23] : [0, 59] Set
Forced Discharge End Time 3 [0, 23] : [0, 59] Set

Peak Shaving

Grid Peak-Shaving Enable Disable
Grid Peak-Shaving Power(kW) [0, 25.5] Set

Start Peak-Shaving Volt 1(V) [40, 59] Set
Start Peak-Shaving Volt 2(V) [40, 59] Set

Start Peak-Shaving SOC 1(%) [0, 100] Set
Start Peak-Shaving SOC 2(%) [0, 100] Set

Peak Shaving Start Time 1 [0, 23] : [0, 59] Set
Peak Shaving Start Time 2 [0, 23] : [0, 59] Set

Peak Shaving End Time 1 [0, 23] : [0, 59] Set
Peak Shaving End Time 2 [0, 23] : [0, 59] Set

- ❖ **System Discharge Rate(%)** The max discharge power percent. Nominal discharge power is 12000W, if you set 50, the max discharge power will be 6000W.
- ❖ **On-grid Discharge Cut-off SOC (%) / Volt(V):** When the inverter connect to the grid, and if the battery is discharging to take the load, it will stop discharge when the SOC is lower than this limit
- ❖ **Off-grid Discharge Cut-off SOC (%) / Volt(V):** When the inverter is in off-grid mode, and if the battery is discharging to take the load, it will stop discharge when the SOC is lower than this limit
- ❖ **Batt Discharge Control:** If the inverter works with the Lithium battery and communication is also compatible, then you can just select charge control according to "SOC", else if the inverter works with lead-acid battery or the lithium without communication, you can select charge control according to "VOLT".
- ❖ **Discharge current limitation (A) :** The max. Discharge current limit when grid power is on.

❖ **Forced Discharge Setting Group** If the customer wants to discharge the battery, you can

enable forced discharge function, and set the discharge power and time period

- **Forced Discharge Enable**
- **Forced Discharge Power (kW)** : Forced discharge power limit
- **Stop Discharge SOC(%)/ Volt(V)**: If Battery SOC is Lower than this limit, the inverter will stop forced discharging function.
- **Forced Discharge Start Time 1**
- **Forced Discharge End Time 1**
- **Forced Discharge Start Time 2**
- **Forced Discharge End Time 2**
- **Forced Discharge Start Time 3**
- **Forced Discharge End Time 3**

❖ **Peak-Shaving Setting group** is used to set the max. Power that the inverter can draw from the grid , and you can read the further information via video or the guidance for this function .

- **Peak-shaving enable**
- **Peak-shaving power (kW)**
- **Start Peak-shaving SOC1 (%) / Volt 1(V)**
- **Start Peak-shaving SOC2 (%) / Volt 2(V)**
- **Start Peak-shaving time1**
- **Stop Peak-shaving time1**
- **Start Peak-shaving time2**
- **Stop Peak-shaving time2**

AC Couple	
AC Couple Start Volt(V) [40, 52]	Set
AC Couple End Volt(V) [40, 50]	Set
AC Couple Start SOC(%) [0, 80]	Set
AC Couple End SOC(%) [0, 100]	Set
Smart Load	
Start PV Power(kW) [0, 25.5]	Set
Smart Load Start Volt(V) [40, 59]	Set
Smart Load End Volt(V) [40, 59]	Set
On Grid Always On	Enable Disable
Smart Load Start SOC(%) [0, 100]	Set
Smart Load End SOC(%) [0, 100]	Set
Lead-acid Battery Setting	
Discharge Temperature Low Limit(°C) (?) [0, 100]	Set
Discharge Temperature High Limit(°C) (?) [0, 100]	Set
On Grid Discharge Derate Vbatt(V)	Set
Start Discharge P _{import} (W) [50, 1]	Set

- ❖ **AC couple Setting group** The inverter supports AC coupling connection with the existing grid-interactive solar system. The existing solar system is connected to the inverter's GEN port. Please see the related guidance for further information .
 - **AC couple Start SOC (%) / Volt (V)**
 - **AC couple Stop SOC (%) / Volt (V)**

- ❖ **Smart Load Setting group** When Smart load function is enabled ,the GEN port will be reused to Smart Load ,and the inverter will offer power to this load based on the setup values.
 - **Start PV Power(kW):** This is the MIN. PV power limit to function smart load output .
 - **On Grid always on :** Once this function is enabled , smart load will always work when grid power is on.
 - **Smart Load Start SOC (%) / Volt (V):** The high limit for battery to turn on smart load
 - **Smart Load Stop SOC (%) / Volt (V):** The low limit for battery to turn off smart load

- ❖ **Lead acid Battery Setting group**
 - **Discharge Temperature Low Limit:** If the temperature is lower than low limit, the inverter will stop discharge battery
 - **Discharge Temperature High Limit :** If the temperature is higher than high limit, the inverter will stop discharge battery
 - **On-grid Discharge Derate Vbat :** For leadacid battery mode Discharge power will begin to derate when reaching "On-grid Discharge Derate Vbat" level. The discharge power will be 0 when reaching cut-off voltage -1V. Leave "On-grid Discharge Derate Vbat" equal to "Discharge cut-off voltage" ,to disable this function automatically

- **Start Discharge P_import (W):** Default value is 100, that means the battery will begin to discharge power to take the load when the import power from grid is higher than 100Watts. (Adjust range[50-100]).

8. Reset Setting



- ❖ **All to Default** All parameters will be reset to factory setting.

——END——