

CONTENTS







Storion-H30 series

H30 has indoor and outdoor versions, equipped with 30kW PCS, M7790-S, M38210-SC battery, DC/DC converter and ATS. The battery capacity is from 34.56kWh~96.77kWh.





- High security, Easy installation
- All-in-one design
- Multi-channel MPPT
- High rate battery, full power out
- Intelligentize

Outdoor

Indoor



High security, Easy installation

- Battery adopts plug & play scheme to avoid complex power cables installation, improve safety and reduce installation time by 30%
- Multiple safety protection designs. In the event of abnormalities, the main circuit can be swiftly disconnected within milliseconds
- IP20 & IP54 design, excels in meeting diverse application demands of harsh environments
- Outdoor cabinet built-in aerosol, provides systemlevel fire protection





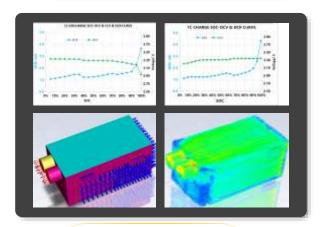
High security-high efficiency heat management design

Modular heat disspation design

Simulation&test verification

Parallel air ducts

Fan-forced convection



Module cooling path

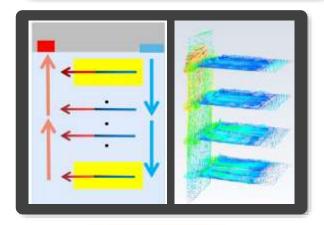
System air duct design

Air conditioner

Parallel duct design

Adapt to various operation

conditions



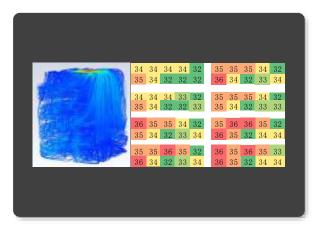
System cooling path

Alpha ESS Your Smart Energy

System temperature data

1C Max temperature: 36°C

System temperature difference ≤5



System temperature data



All-in-one design

- High integration: built-in battery modules, high voltage box,
 PCS, DCDC, EMS and other components
- Convenient maintenance: the front and back door design,
 system can be maintained from both sides
- All-in-one design maximizes the utilization rate of space and increases the utilization rate of space by 30%





Multi-channel MPPT

- Support multi-directional installation of photovoltaic panels
- Built-in 3 MPPTs, each MPPT support 2 strings PV panel,
 MPPT's tracking efficiency up to 99.9%





Intelligentize

It can provide users with intelligent solutions for energy storage systems

- Battery health monitoring, battery SOC status correction
- Online fault warning, diagnosis and location
- Station equipment detection, alarm, remote maintenance and automatic system upgrade
- Real-time monitoring via App for comprehensive data management



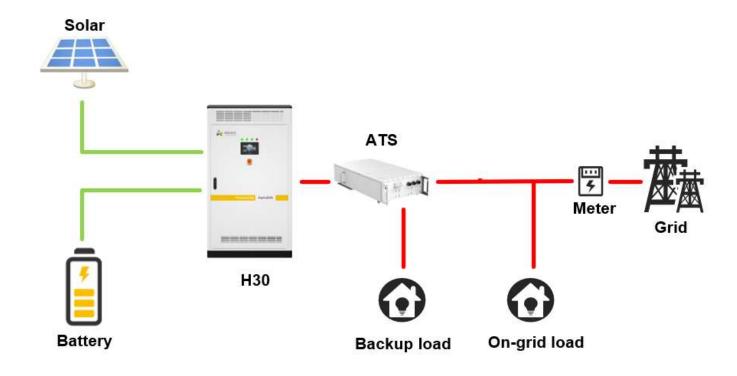


Function

- Priority: Force charge (SOC calibration Forced Charge-Undervoltage) > Peakshave > Pmeteroffset > Time Period
 Charge and Discharge > Self-sufficient
 - Self-sufficient
 - Time Period Charge and Discharge
 - PeakShave
 - Pmeteroffset
 - Backup (30ms)
 - RRCR

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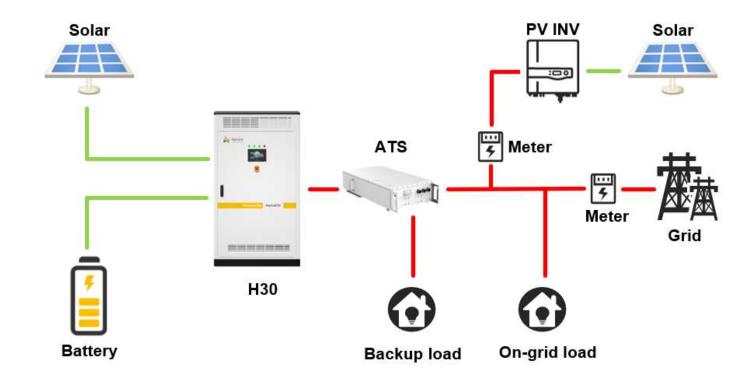
System SLD



DC grid-connected system

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System SLD



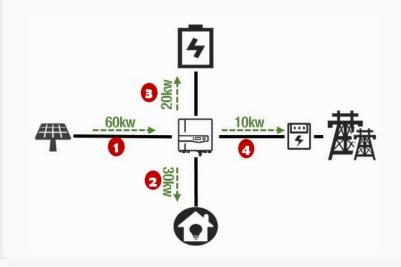
Hybrid grid-connected system



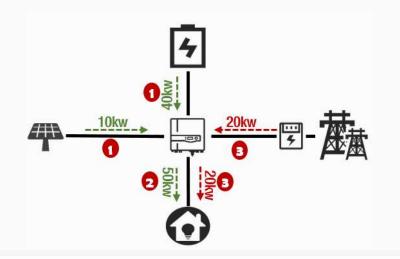
Self-Sufficient

Electricity generation – Electricity consumption – Electricity storage

When the PV capacity is sufficient, it will supply the load first and then charge the battery. Any excess energy will be transmitted to the grid. If there are limitations on feed-in power, it can be controlled and set by EMS



When the load consumption is high, PV will power the load primarily. If PV power is not sufficient, the battery will power the load. If the battery power is still insufficient, the grid will power the load.



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Time period charge and discharge

Support Four groups of "Time period charge and discharge"

During the charging period, the system will force charge the battery. Power is sourced from PV first, then from the grid until reaching the "charging cut-off SOC". During this period, the battery does not discharge, and PV output remains normal. The Self-Sufficient logic is active outside the charging period.



During the discharging period, the Self-Sufficient logic is active; outside the discharging period, the battery does not discharge and PV output remains normal.



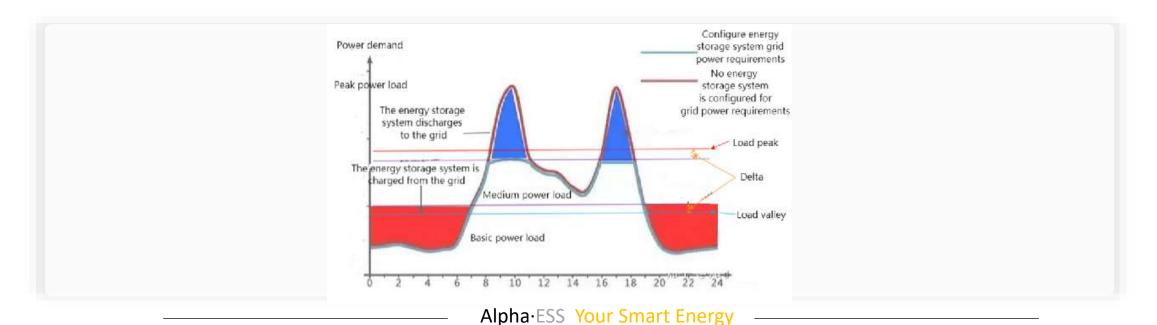
For sites with price differences between peak and valley electricity, the time period can be set accordingly. The battery will be fully charged during valley time and discharged to zero during peak time to achieve peak-valley arbitrage.

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Peak shaving & load shifting

During the time period, when the purchased power exceeds the peak value (range: -3000kW~3000kW) or falls below the valley value (range: -3000kW~3000kW), the system charges or discharges the power to make the meter power remain below (peak-delta) or above (valley+delta).

When peak shaving and load shifting are not triggered, the system output/input is 0. Two periods can be set for peak shaving and load shifting. Outside the periods, the grid-connected logic will be active. The Delta (Range: 0.5kW~20kW) can be set based on the system.

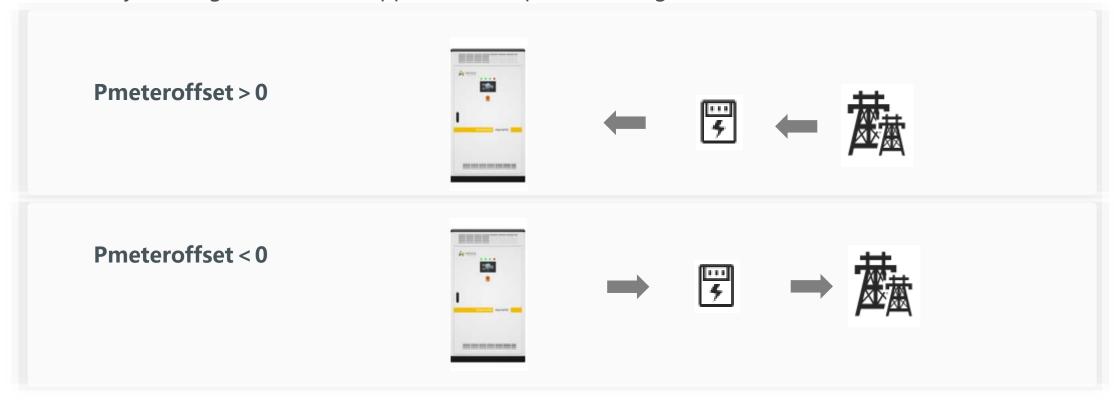




Pmeteroffset: Limit meter output and input power

By setting the offset of the grid meter, the fixed power can be bought from and sold to the grid.

A positive value indicates purchasing electricity from the grid while negative value indicates selling electricity to the grid. The EMS supports 4 time period settings.





RRCR: Radio Ripple Control Receiver

There is a dispatching device on the grid side, which is equipped with four passive dry contacts and connected to EMS.

The conduction of each dry contact represents different maximum feed-in power limits (Feed-in K1~4). The EMS controls the preset maximum feed-in power limit based on the detected status of the dry contacts.

RRCR Enable	
• Feed-in K1	
• Feed-in K2	
• Feed-in K3	
• Feed-in K4	









The H30 indoor and outdoor solution supports 1 standard battery cluster:

M38210-S battery: 8-12 units, 69.12kWh-96.768kWh M7790-S battery: 5-8 units, 34.56kWh-55.296kWh

Model	STORION-H30-O	STORION-H30	
Battery	LiFePO4 (Ma	ax. 96.7kWh)	
Battery Voltage Range	150V~750V (350	~750V full-load)	
PV Voltage Range	250V-	~830V	
Number of MPPT	3	3	
Rated Power	301	kW	
Max. Input Power	60kW		
Grid Frequency	50/60Hz		
Rated Grid Voltage	3L/N/PE 400VAC±15%		
Overload Capacity	110% ~ 120%, 10min; 120% ~ 150%, 200ms		
Cooling	HVAC Forced Air Cooling		
Weight	< 1.6T < 1.4T		
Protection Level	IP54 IP20		
Dimensions (L*W*H)) 1200*900*2160mm 1100*900*2000mm		
Fire Protection	Aerosol Fire Protection Smoke Temperature Composite Detector		

Battery M7790-S





M7790-S			
Battery Type LiFePO4			
Rated voltage	76.8V		
Nominal capacity	6.912kWh		
Operation voltage range	72~84.48V		
Pack	3.2V/90 Ah@1P24S		
Max. Charging/Discharging Current	90 A		
System cycle life	80% EOL with 6000@1C 25°C		
Weight	64 kg		
Dimensions (W x D x H)	326 x 654 x 250mm		
IP Protection	IP20		
Communication	CAN		

Battery M38210-SC —(coming soon)





M38210-SC			
Battery Type LiFePO4			
Rated voltage	38.4V		
Nominal capacity	8.064kWh		
Operation voltage range	36~43.2V		
Pack	3.2 V / 105 Ah@2P125		
Max. Charging/Discharging Current	105 A		
System cycle life	80% EOL with 6000@0.5C 25°C		
Weight	64 kg		
Dimensions (W x D x H)	325 x 658 x 232mm		
IP Protection	IP20		
Communication	CAN		



HV900105—suitable for M38210-SC and M7790-S



	HV900105
Operation voltage range	200 ~ 900V
Pack connection	M38210-S & M7790-S in series
Rated current	105A
Weight	20kg
Power consumption	< 10W
Colour	RAL7035

45kW DC/DC Converter





PDS1-45K				
Rated power	45kW			
PV open-circuit voltage	250~830V			
MPPT voltage range	200~750V(430~750V full load)			
MPPT number	3			
MPPT max input current	35A/35A/35A			
Output voltage range	700~830V			
Rated output current	65A			
Size (width*depth*height)	485 x 173 x 580mm			
Weight	24kg			
IP Protection	IP20			
Operating Temperature Range	-20~60°C			
Humidity	0-95%			

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PCS: PWS2-30P-EX



	Alþi			
PWS2-30P-EX				
Battery voltage range	150~750V (350 ~750V full-load)			
Max battery current	90A			
DC bus voltage	700~830V			
Rated power	30kW			
Rated grid voltage	400V, 3L/N/PE			
Grid frequency	50/60Hz			
Max efficiency	97.3%			
Over-load capability off-grid	110%~120%, 10 min 120%~150%, 200 ms			
Weight	33 kg			
Size (width*depth*height)	440 x 173 x 596mm			
IP Protection	IP20			
Working environment temperature range	-30 °C ~60°C (>45°C derating)			
Humidity	0-95%			

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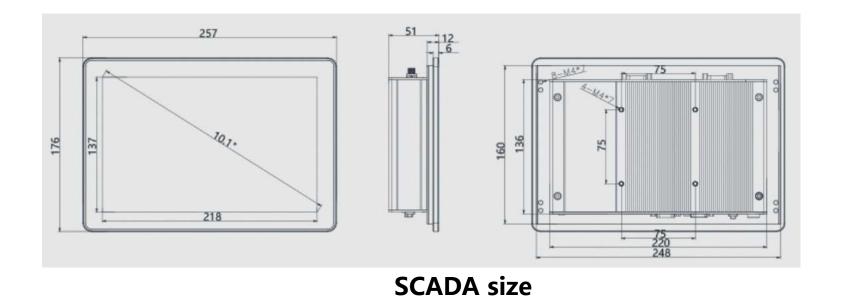
100kW ATS



PWD-100K			
Rated power 100kVA (Grid & loa			
Rated grid voltage	400V, 3L/N/PE		
Max current	145A		
AC frequency 50/60Hz			
Switching time	30ms		
Size (width*depth*height)	440 x 205 x 920mm		
weight	32kg		
IP Protection	IP54		
Operating Temperature Range	-20~60℃		
Humidity	0-95%		
Installation method	Wall-mounted		



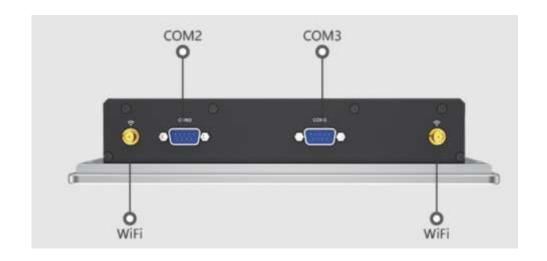
SCADA



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SCADA





SCADA Port



Meter/CT





DTSU666			
Reference voltage 3x380V			
Current specification	1.5 (6A)		
Accuracy class	Active power 0.5S		
Size (width*depth*height)	72×65×100mm		
Communication method	RS485		
СТ	400/5A (Acrel)		
CT size	42.5×58×82mm		
CT Perforation size	Ф36mm		
CT accuracy class	1S		



Certification

Alpha-ESS

PCS

Model	Certification	Safety regulation/Grid- connection	Country	Note
	EN62109-1:2010 EN62109-2:2011 EN 62477-1:2012/A12:2021 Low Voltage Directive 2014/35/EU	CE	EU	complete
	EN IEC 61000-6-2:2019 EN IEC 61000-6-4:2019	EMC	EU	complete
PWS2-30P-EX	BS EN 62109-1:2010 BS EN 62109-2:2011	UKCA	UK	complete
	VDE-AR-N 4105:2018	Grid-connection	Germany low voltage	complete
	OVE-Richtlinie R 25:2020	Grid-connection	Austria	Listing on-going
	EN 50549-1:2019+AC:2019-04	Grid-connection	Dutch	complete

Certification

Alpha-ESS

PCS

Model	Certification	Safety regulation/Grid- connection	Country	Note
	G99/1-6:2020	Grid-connection	UK	Listing on-going
	AS/NZS4777.2:2020 IEC 62109-1:2010 IEC 62109-2:2011 IEC 62477-1:2012+A1	Grid-connection + safety rules (CEC listing on- going)	Australia	complete
PWS2-30P-EX	VDE4110	Grid-connection	Germany low voltage	VDE4110 is pre- certification which is valid within 2 years. Predicated complete time 2024/3/31。
	C10, C11(use VDE4105 to apply listing)	Grid-connection	Belgium	Listing on-going
	Nc Rfg CEI 0-21	Grid-connection Grid-connection	Poland Italy	Certification on-going

Certification

Alpha-ESS

Battery

Model	Certification	Safety regulation/Grid- connection	Country	Note
	62477	Safety regulation/Grid- connection	Australia	
	62619	Safety regulation	Australia	
M7790-S	61000	CE-EMC	EU	
	6100	UKCA-EMC	UK	complete
	UN38.3	Transport		complete
	62619	Safety regulation	Australia	
M38210-SC	UN38.3	Transport		
	61000	CE-EMC	EU	



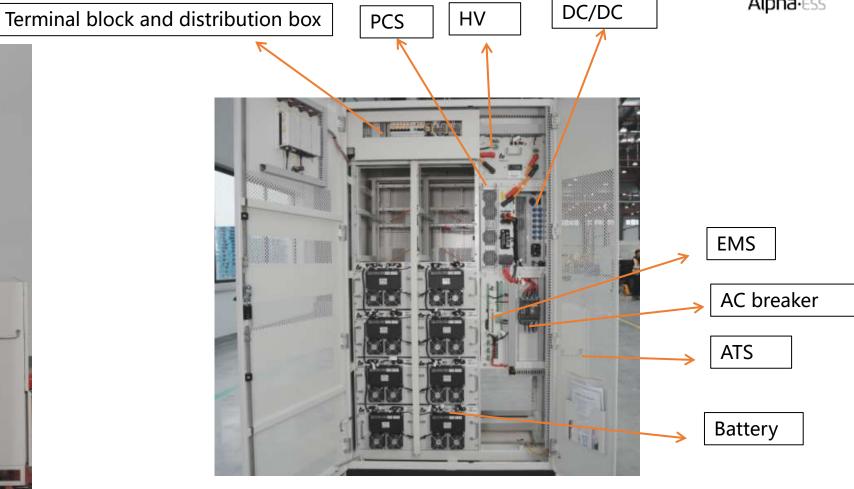
H30 indoor internal layout



SCADA



Front view of H30-indoor



Internal layout of H30-indoor

H30-O internal layout



HV

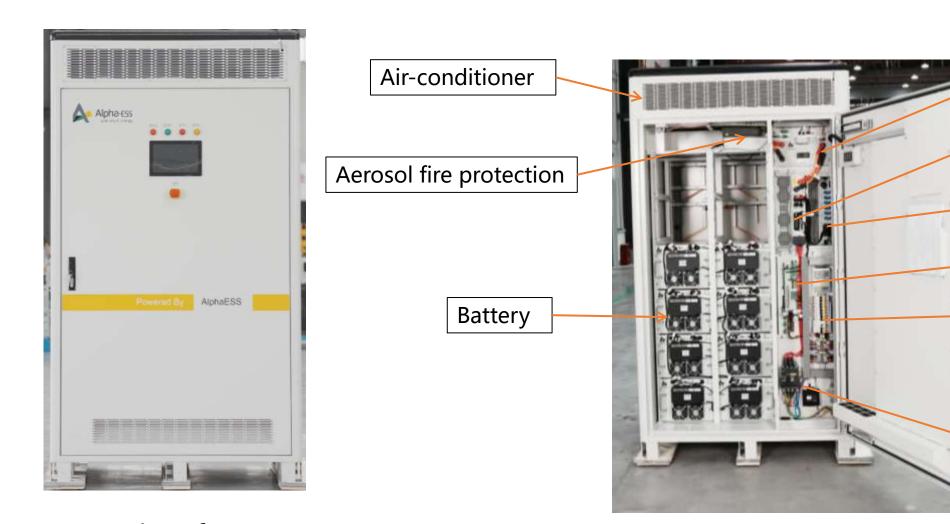
PCS

DC/DC

EMS

Secondary line

AC breaker



Front view of H30-O

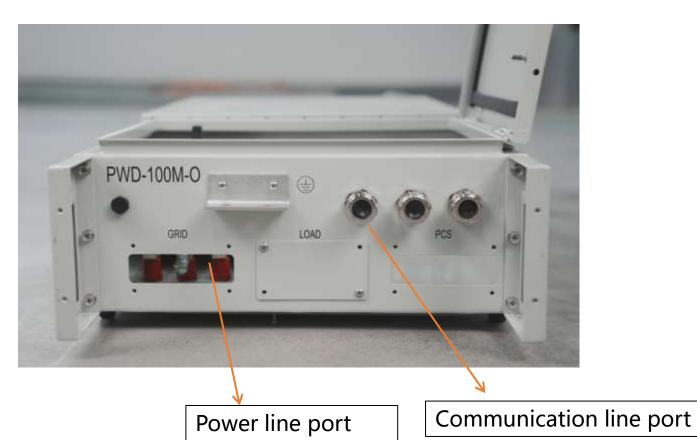
Internal layout of H30-O

ATS structure





ATS

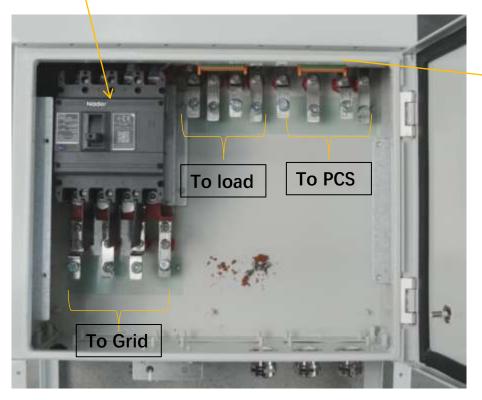


ATS port

ATS structure



Bypass breaker



Zoom in

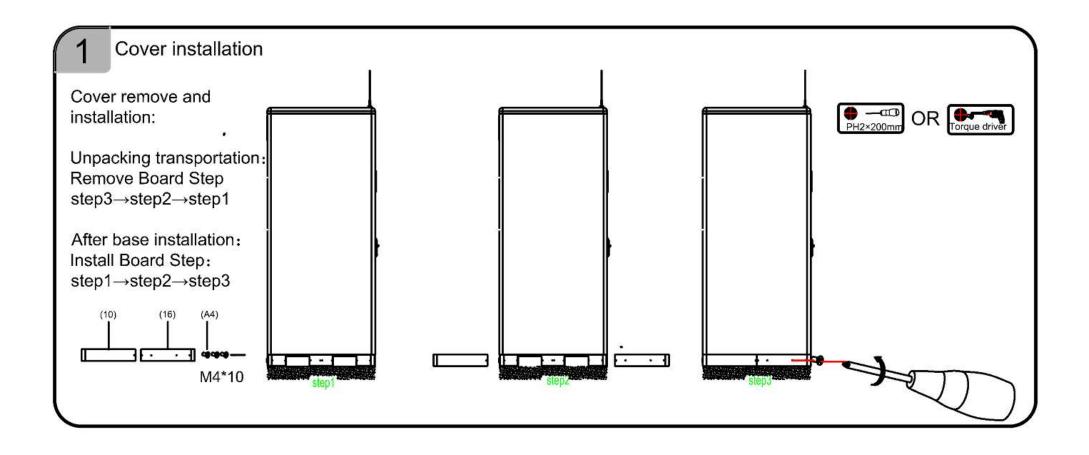


ATS internal layout

ATS communication port

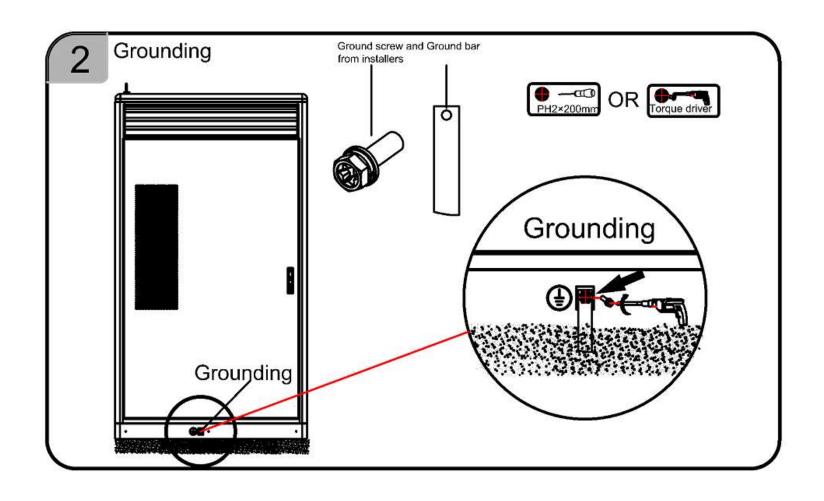
Installation--Cover





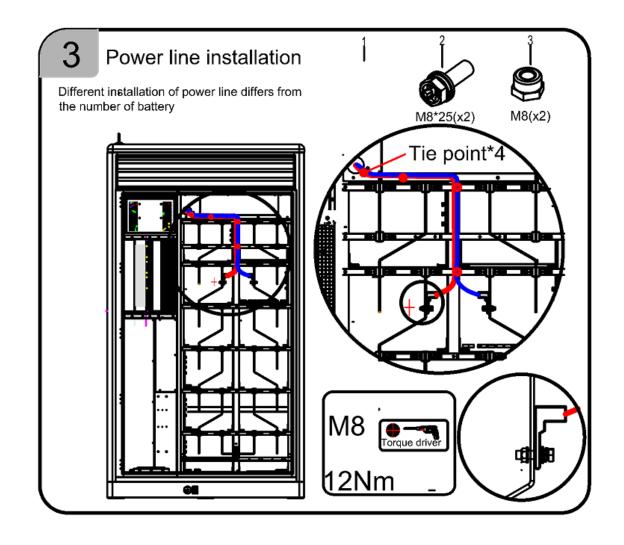
Installation--Grounding





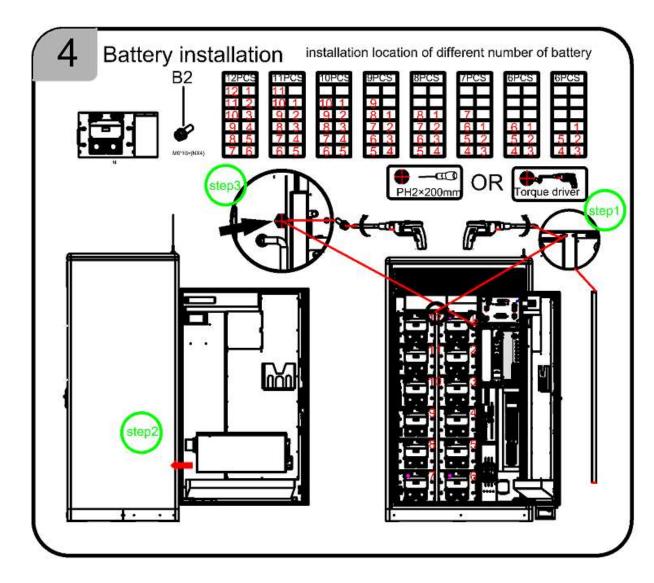
Installation—Power line





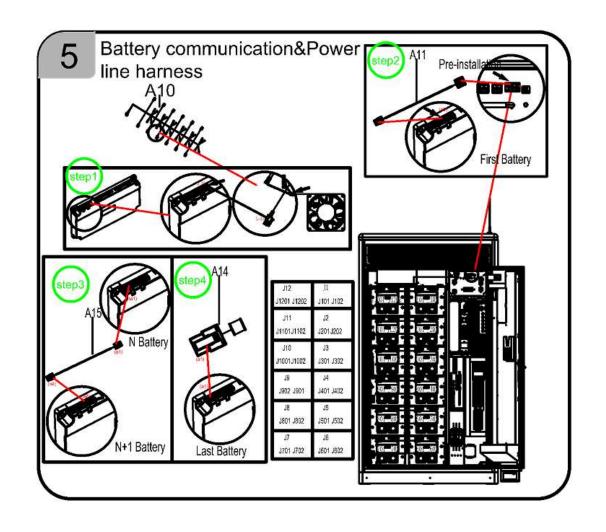
Installation—Battery





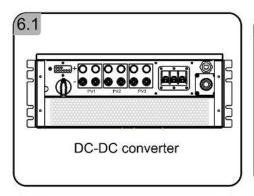
Installation—Battery communication & Power line harness

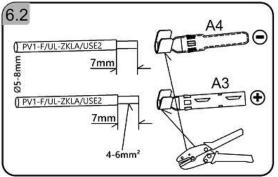


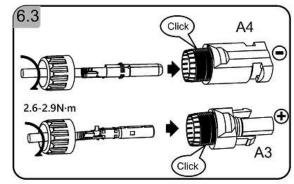


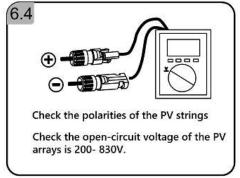
Installation—PV power cable

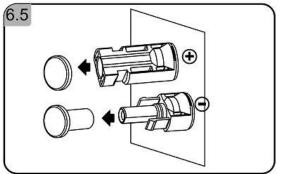


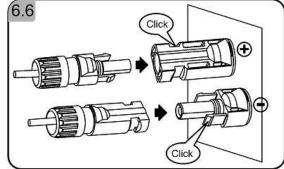






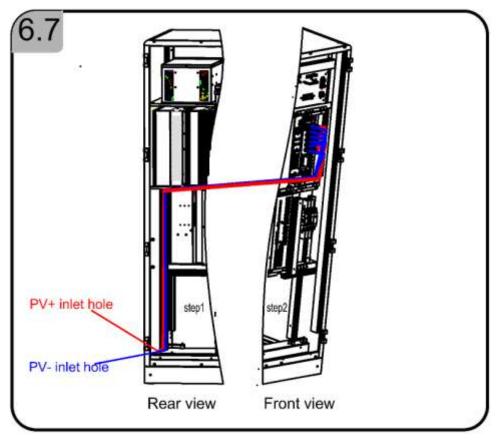


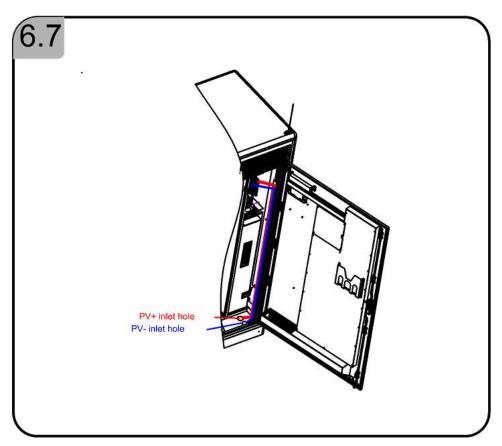




Installation—PV power cable



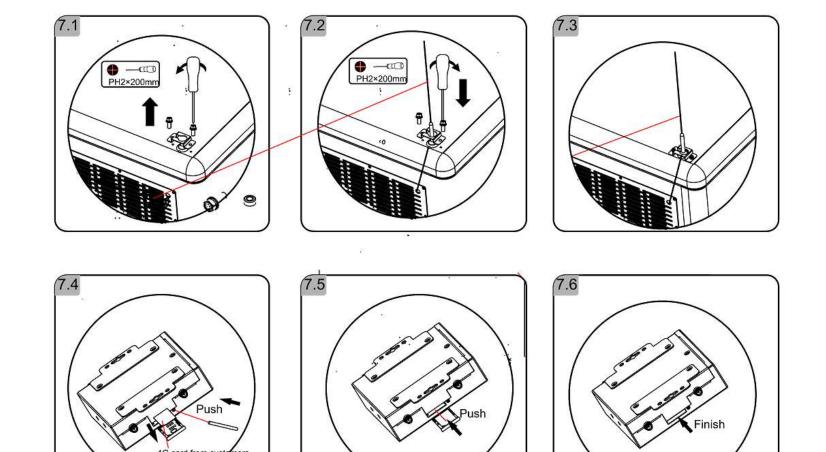




H30-O

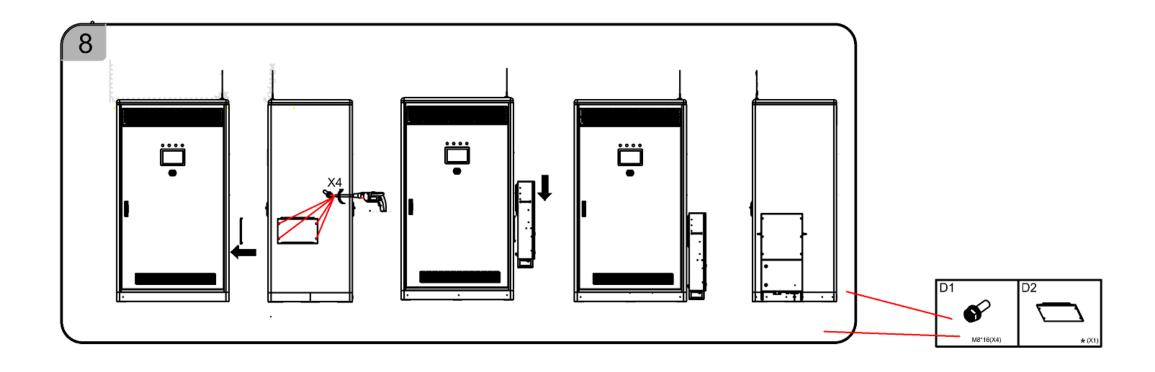
Installation—Antenna and 4G module (H30-O)





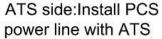
Installation—ATS

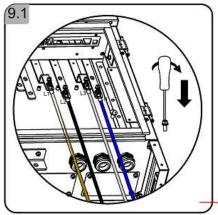




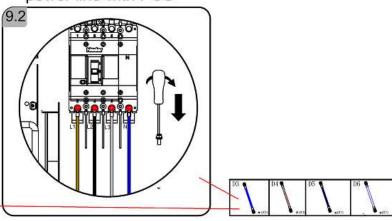
Installation—ATS wiring



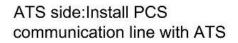


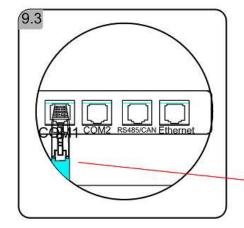


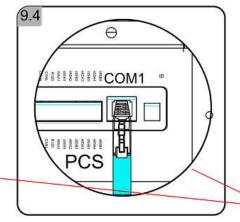
PCS side:install ATS power line with PCS



PCS side:Install ATS communication line with PCS









SCADA network cable (H30)









Check Before Operation





Before operation, please check the equipment according to following procedures:

If no sign of damage is inspected visually outside the system module and all the battery switch, Grid switch are in the "OFF" position

- A. Check whether the DC input wiring of the energy storage system and the AC output wiring are normal and whether the grounding is good;
- B. Check whether the wire connection polarity is normal;
- C. The EPO button should be in reset state.

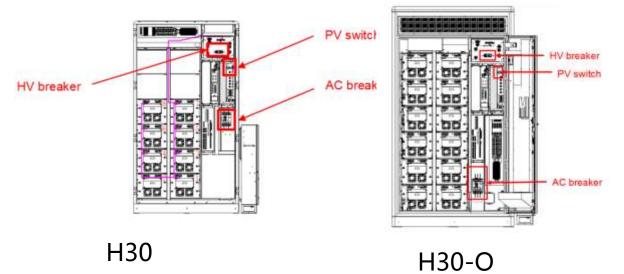
Power-on Procedure



The system shall be turned on in the correct sequence to avoid any damage.

A. Turn on the breaker of HV900105, wait 3-5 minutes for the batteries to start.

B. Turn on the AC breaker of H30/ H30-O system. Turn on the PV switch of H30/H30-O system.



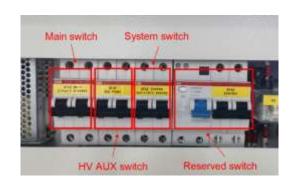


Power-on Procedure

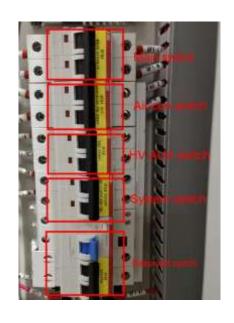


C1. For H30: Turn on the main switch, HV AUX switch, and system switch. (The reserved switch does not need to be turned on)

C2. For H30-O: Turn on the main switch, HV AUX switch, and system switch. (The reserved switch does not need to be turned on)



C1



C2

D. Normal system operation.

After the system is powered on, it will run automatically if there are no errors and warnings.



Login and Permission

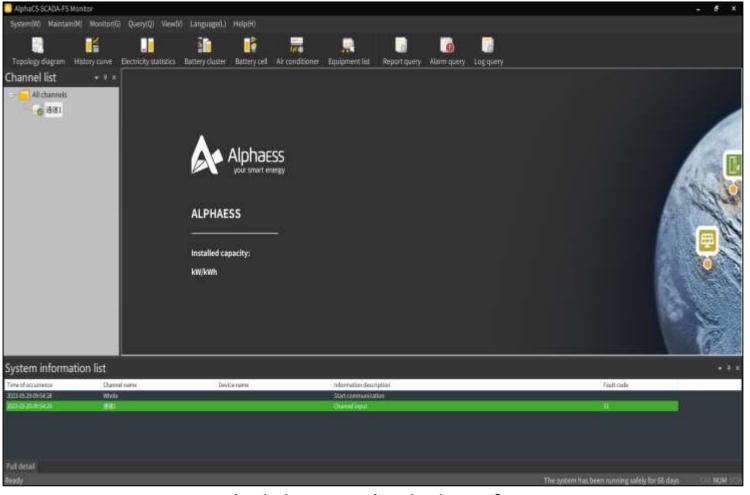


System login	×
ENERGY STORAGE SYSTEM	Alpha-ess
Username: Password:	
Confirm	Cancel

System login window

Login interface

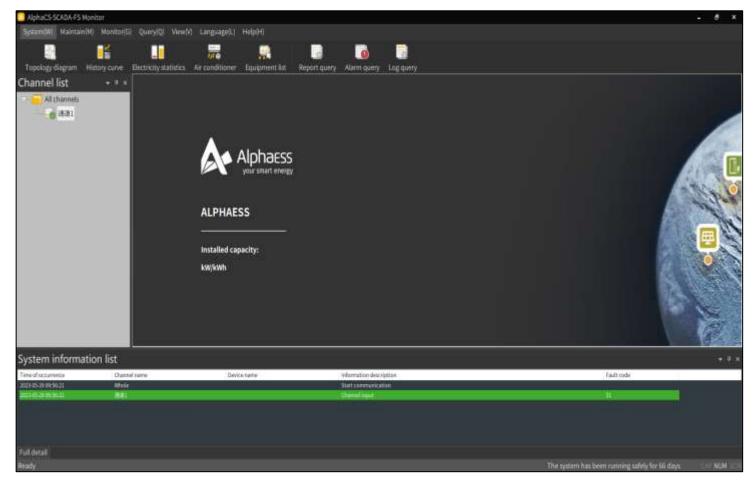




Administrator login interface (Administrator of Alpha)

Login interface

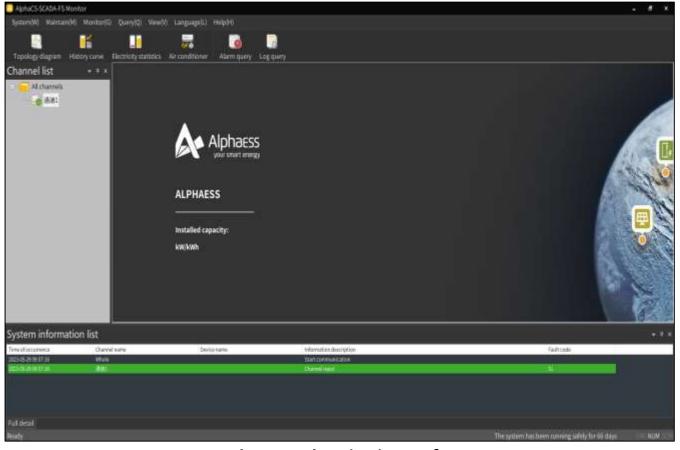




Advanced User login interface (installer agency)

Login interface

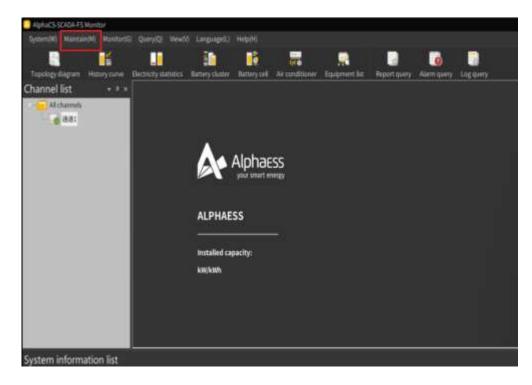




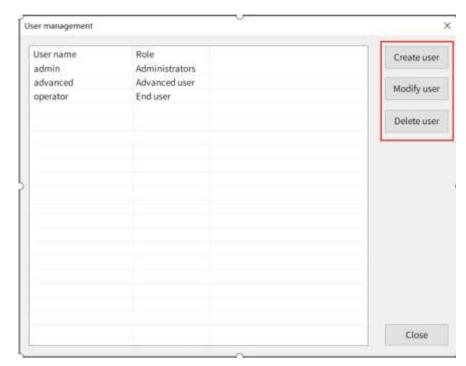
End User login interface (SCADA operator)

User management





Click 'maintain' - 'User management'



User management interface (default account)

User management

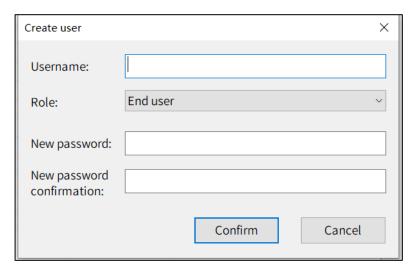


	Created user	Create advanced user	√
		Create end-user	
A dualistic to set ou	Modify user	Modify advanced user	
Administrator		Modify end user	
	Delete user	Delete advanced user	
		Delete end user	V
	Created user	Create end user	V
	Modify user	Modify yourself	√
A di		(apart from default advanced user)	
Advanced user		Modify end user	√
	Delete user Delete	Delete end user	√
	Modify user	Modify yourself	√
End user		(apart from default end user)	

Access for different users

User management—Create/Modify/Delete account







Create User

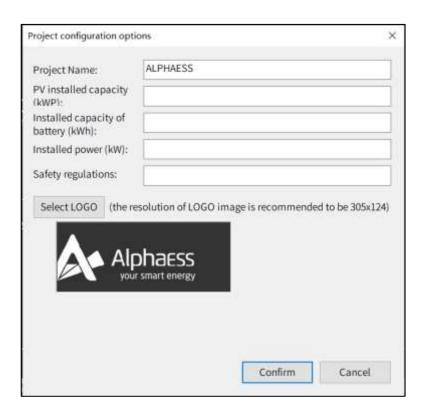
Modify User

Delete User

Project configuration



Click 'System' — 'Stop'; Click 'Maintain' — 'Project configuration options'

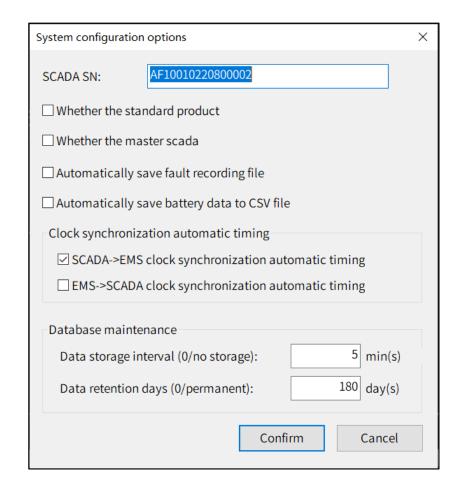


Project configuration interface

System configuration



Click 'Maintain' — 'System configuration options'

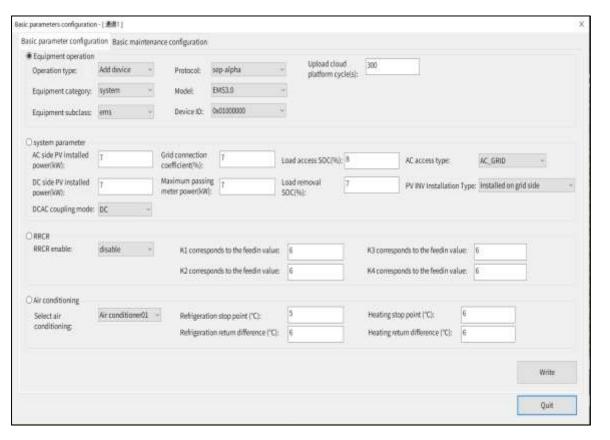


System configuration option interface

Configuration management---Basic configuration



Click- 'Maintain' - 'Configuration management' - 'Basic configuration'



Basic configuration interface

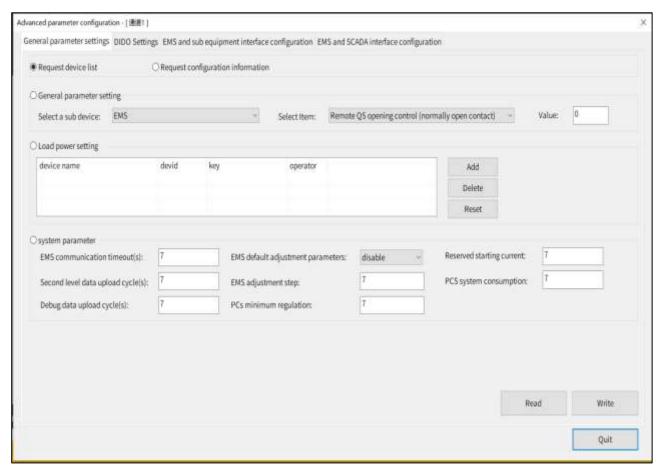
Configuration management---Senior configuration



Click- 'Maintain' - 'Configuration management' - 'Senior Configuration'

Senior configuration Including:

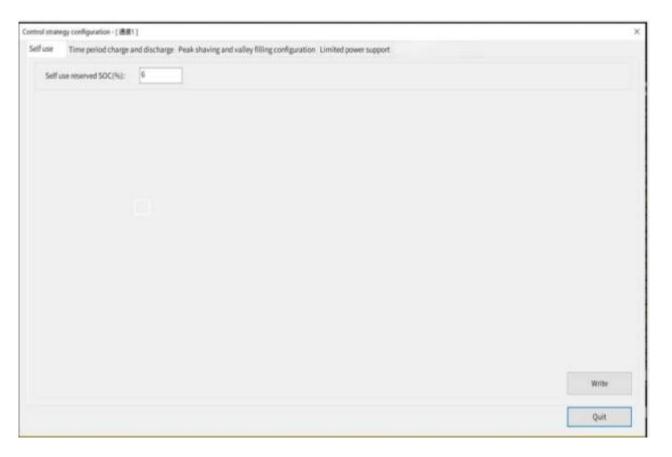
- 1. General configuration
- 2. DIDO setting
- 3. Port setting between EMS and subset
- 4. Port setting between EMS and SCADA



General configuration interface



Click- 'Maintain' - 'Configuration management' - 'Control scheme'



Self-sufficient interface



If use Time period Charge	Be are a serial Be	r con snoring one va	lley filling configuration Limit	en boutet anbhout			
☐ Charging time1	22:00	- 23:00	Charging power (kW);	1654.8	Charge cut-off SOC (%):	1130]
☐ Charging time2	22:00	- 23:00	Charging power (kW):	6	Charge cut-off SOC (%):	6	
☑ Charging time3	22:00	- 23:00	Charging power (kW):	6	Charge cut-off SOC (%):	6	
☐ Charging time4	22:00	- 23:00	Charging power (kW):	6	Charge cut-off SOC (%):	6	
Discharge							
☐ Discharge time1	22:00	- 23:00	Discharge mode: Fixed power	Discha (kW):	arge power 0	Discharge cut-off SOC (%):	43690
☑ Discharge time2	22:00	- 23:00	Discharge mode: Fixed power	Discha (kW):	arge power 6	Discharge cut-off SOC (%):	66
☑ Discharge time3	22:00	- 23:00	Discharge mode: Fixed power	Discha (kW):	arge power 6	Discharge cut-off SOC (%):	66
☑ Discharge time4	22:00	- 23:00	Discharge mode: Fixed power	Discha (kW):	arge power 6	Discharge cut-off SOC (%):	6
							Write

Time Period Charge and Discharge



Peak shaving and valley filling Peak clipping upper 55	enable						
limit(kW):		ower limit of alley filling(kW):	Adjustment return difference(kW):	4 P	eak clipping discharg ut-off SOC(%):	3e 10	
Peak shaving period 1 enable	22:00	23:00	Peak sha	ving period 2 enable 22:00	23	3:00	
Peak shaving period 3 enable	22:00	- 23:00	_ Peak shar	ving period 4 enable 22:00	- 23	3:00	
Valley filling period 1 enable	22:00	- 23:00	. □ Valley filli	ing period 2 enable 22:00	23	3:00	
Valley filling period 3 enable	22:00	- 00:00	□ Valley filli	ing period 4 enable 22:00	23	3:00	

PeakShave



trol strate	egy configuration - [通道1]									
elfuse	Time period charge and discharge	Peak shaving	g and valle	y filling confi	guration	Limited power support				
	er-limited power support enable	6					6			
Pow	er-limited power support enable:					Meter power adjustment offset(kW):			_	
Pow	er-limiting support period enable 1	17:00	÷	21:00	÷	Power-limiting support period enable 2	17:00	<u> </u>	21:00	•
Pow	er-limiting support period enable 3	17:00	•	21:00	•	☑ Power-limiting support period enable 4	17:00	•	21:00	•
										Write
										Quit

Pmeteroffset



Power-off Procedures



The system shall be powered off according to following steps:

- A. Turn off the AC breaker of the H30/H30-O system.
- B1. Turn off the main switch, HV AUX switch, system switch on the top part of H30.
- B2. Turn off the main switch, HV AUX switch, system switch, air-con switch of H30-O.
- C. Turn off the HV900105 breaker.



