



Powermount-1MW/2MWh ESS Technical Proposal

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1. Dunext Company Introduction

Dunext is a leading technology company dedicated to PV & energy storage industry, offering innovative solutions for distributed PV & storage solution. Our team has over a decade's experience of global market development and 15 years of expertise in key technological fields, including power electronics, digital technology, energy storage, and thermal design. Committed to core innovation and worldwide service capabilities, Dunext provides secure, reliable, one-stop solutions and services, aiming to become the premier partner in the new energy sector.

Dunext's headquarters is in Suzhou, Jiangsu Province, China. The company focuses on overseas market expansion, especially in Europe. We have established four subsidiaries in Singapore, the Netherlands, Poland, and the UK, along with offices in several other countries to better serve local customers.

Our factory covering an area of 5,000 square meters with a planned production capacity of 1 GWh, which can provide strong support for our growth.

At our Suzhou headquarters, we have an independent laboratory capable of conducting various professional tests, including high and low-temperature, reliability, communication, certification, power quality, and electrical safety tests. This ensures the quality and competitiveness of our products.

The R&D team includes experts from Industry TOP Enterprises, each with over 15 years of experience in power, electronics, and battery technologies. Their expertise drives innovation and product development in the renewable energy sector.

With overseas service centers, we provide fast, efficient, and professional one-stop solutions to meet customer needs.

Safety is Dunext's top priority and a core value. From product design and development to manufacturing, transportation, and installation, safety is embedded in every step of the process.

We believe stability is the foundation of strong business relationships with our customers and partners. Especially when working with channel partners, it's important to maintain consistent policies, pricing, and clear communication.

Our slogan is: "Innovate for a Green Future." With innovation as the driving force, we are committed to leading the way in clean energy development and creating a sustainable future.

2. Powermount-1MW/2MWh product Introduction



Containerized Battery Energy Storage System

2.1 Product Features

- **AC/DC Coupling**
Powermount-1MW/2MWh can Support DC Coupling, PV modules can be connected to MPPT modules, and Powermount-1MW/2MWh can Support AC Coupling, EMS is compatible with numerous mainstream PV inverter brands.
- **Multiple Energy Access**
Powermount-1MW/2MWh can Support the integration of Solar, diesel generator, wind turbine, etc.
- **Modular O&M**
Modular O&M without interference in the normal operation of other modules for cost savings and utilization optimizing.
- **Muti Application**
Capacity Expansion\Peak-load Shifting\TOU Tariff Arbitrage\Power Quality Management, etc.

2.2 Product Parameter

Parameters	Powermount-1MW/2MWH
Battery Parameters	
Cell type & capacity	LiFePO4 - 280Ah
System configuration	8*1P280S
System capacity (BOL)	2007KWh
AC Output Parameters	

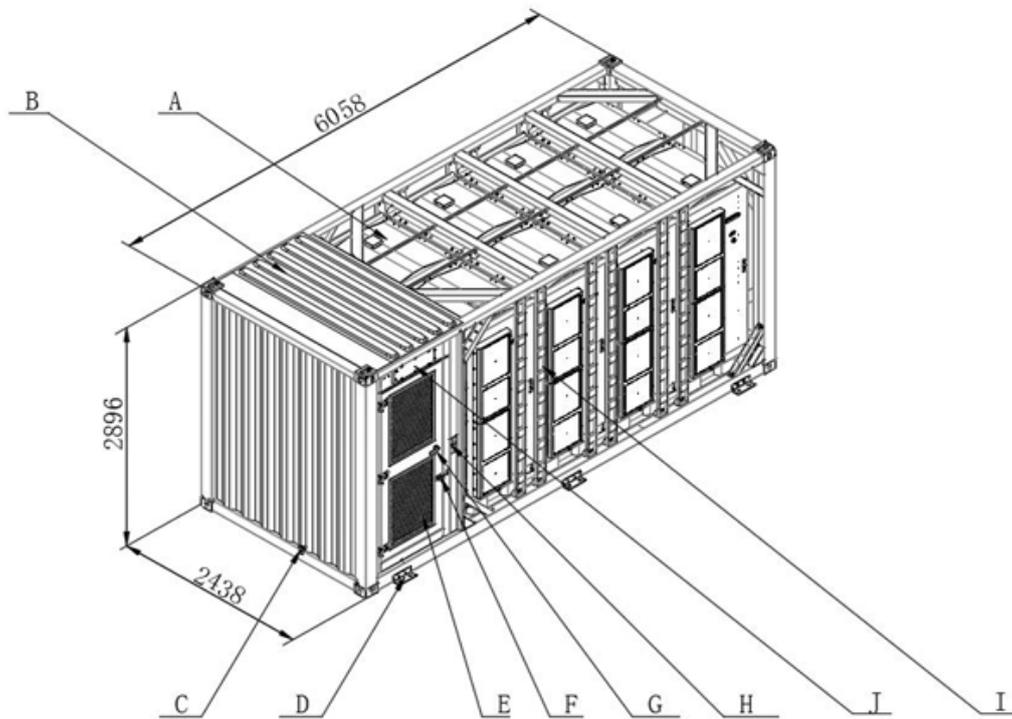
Rated output power	1000KW
Rated voltage	AC400V, 3P4W+PE
Rated grid frequency	50Hz±5Hz/60Hz±5Hz
Max. output current	1443A
Harmonics	< 3% (@rated power)
Overload capacity	110%, continuous
General Parameters	
Protection level	IP54
Anti-corrosion grade	C3
Operating temperature*	-30°C ~ 50°C
Relative humidity	0 ~ 95% (non-condensing)
Operating altitude**	< 3000m
Noise emission	≤75dB
Dimension (W*D*H)	20HQ container (6058mm×2438mm× 2896mm)
Max. weight	27000kg
Firefighting system	Novec1230
Communication interface and protocol	Ethernet, Modbus TCP/IP
Warranty	5 years (can be extended to 10 years)
Certifications	System: UN3536, IEC61000, IEC62477, IEC62619, IEC62933, RoHS Cell: IEC62619, UL1973, UL9540A, UL1642 PACK: UN38.3 PCS: G99, EN50549, AS4777.2, VDE4105, VDE4110, R25&TOR, NC-RfG, NRS, etc.

* The system will be derated when the ambient temperature exceeds 45°C.

**The system will be derated when the altitude exceeds 2000m.

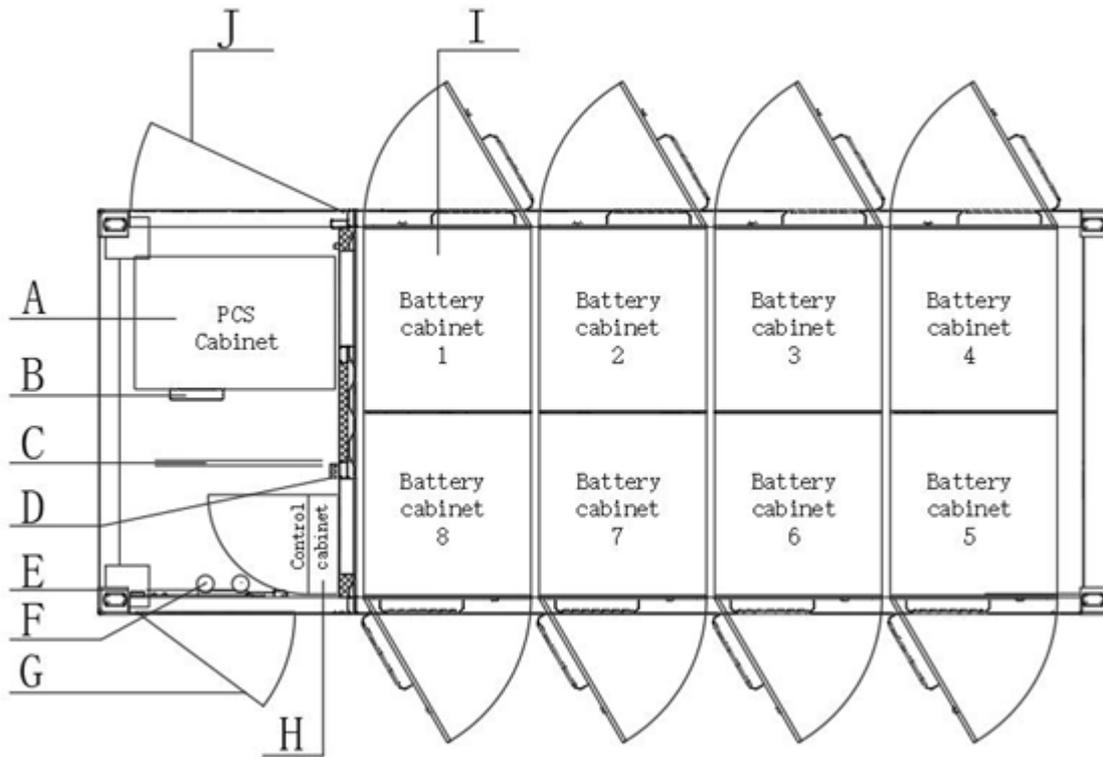
2.3 Product Overview

2.3.1 Powermount 1MW/2mwh Appearance



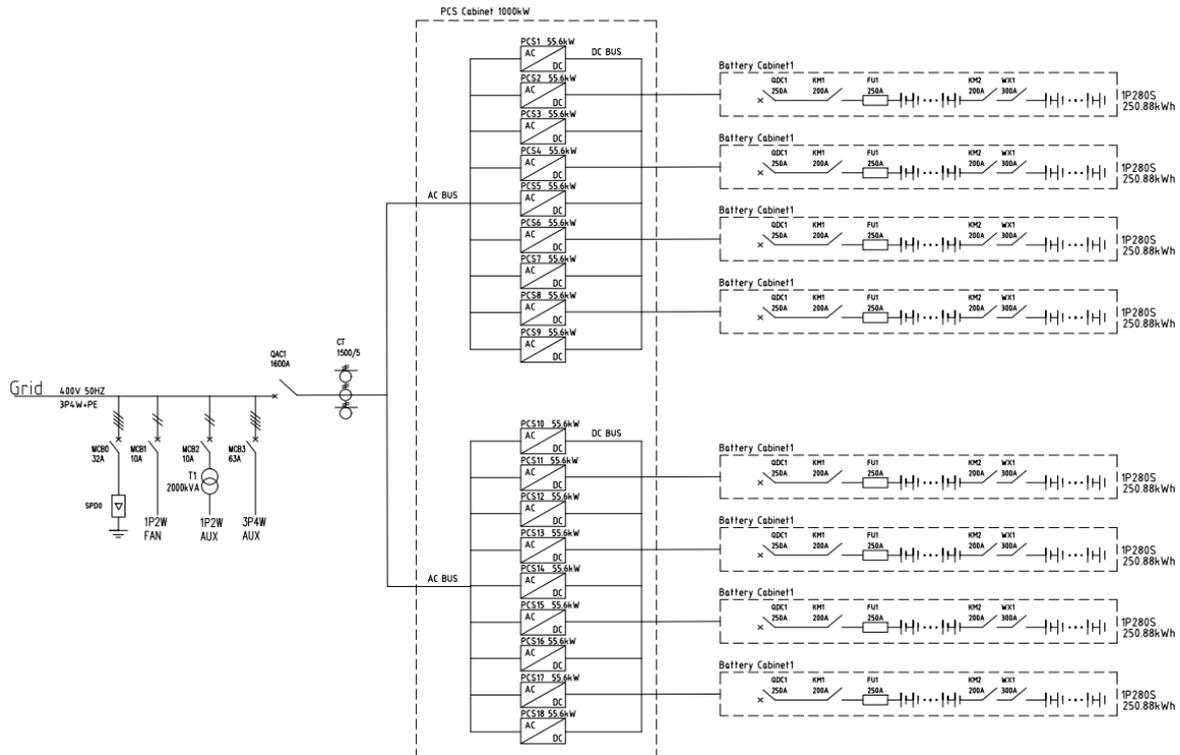
Position	Description
A	Outdoor Battery Cabinet
B	Container electrical equipment warehouse
C	Container grounding point
D	Container mounting bracket
E	Container handling door
F	Container door padlock
G	Container door lock
H	Container external Scram Switch (EPO)
I	Container transport support
J	Alarm bell, sound and light alarm

2.3.2 Powermount 1MW/2mwh Layout



Position	Description
A	PCS Cabinet
B	EMSCabinet
C	General lighting
D	Socket (commissioning spare)
E	General lighting switch
F	Emergency lighting
G	Container operation door
H	Distribution box
I	Outdoor battery cabinet
J	Container maintenance door

2.3.3 Powermount 1MW/2mwh SLD diagram



2.4 Product Composition

2.4.1 Battery Container

BESS includes batteries BMS, Auxiliary power system, fire protection system, air conditioning system, grounding system, etc.

- The battery and BMS system are used to store electrical energy.
- The auxiliary power system provides power to all equipment within BESS.
- The fire protection system is the protection for operators and BESS in the event of a fire.
- Air conditioning is used to regulate the internal temperature of BESS.
- The grounding system is the safety guarantee of BESS.

Cell	Manufacturer	EVE.
	Model	LF280K
	Standard charge & discharge rate	0.5C
	Rated capacity	280 Ah
	Rated energy	896Wh
	Rated voltage	3.2 V
	Cell type	LFP
	Voltage range	2.5V-3.65V
	Battery charge temperature	0°C-50°C
Battery discharge temperature	-20°C-50°C	

	Cycle	≥6000 cycles
	AC internal resistance	≤0.25mΩ (1kHz)
	Standard compliance	IEC62619、 UL1973 UL1642、UL9540A UN38.3
<p>Battery Module</p> 	Manufacturer	Dunext
	Model	P20
	Standard charge & discharge rate	0.5C
	Combination mode	1P20S
	Rated capacity	17.92kWh
	Rated voltage	64V
	Battery charge temperature	0°C-50°C
	Battery discharge temperature	-20°C-50°C
	Cooling method	Air cooling
	Standard compliance	UN38.3、IEC62619
<p>Battery cabinet</p> 	Manufacturer	Dunext
	Model	powerBC-250
	Standard charge & discharge rate	0.5C
	Combination mode	1P280S
	Rated capacity	250.88kWh
	Rated voltage	896V
	Battery charge temperature	0°C-50°C
	Battery discharge temperature	-30°C-50°C
	Cooling method	HVAC
	Weight	2500kg
	IP grade	IP55
	Communication protocol	Modbus RTU、 Modbus TCP/IP
	Standard compliance	UN3480 , IEC62619

2.4.2 PCS

PCS can control the charging and discharge process of lithium battery, carry out AC/DC conversion, and directly supply power to the AC load in the case of having no Grid. PCS is composed of DC/AC bi-directional converter, control unit, etc. The PCS controller receives the control command through communication and controls the

converter to charge or discharge the battery to adjust the active power and reactive power of the Grid.



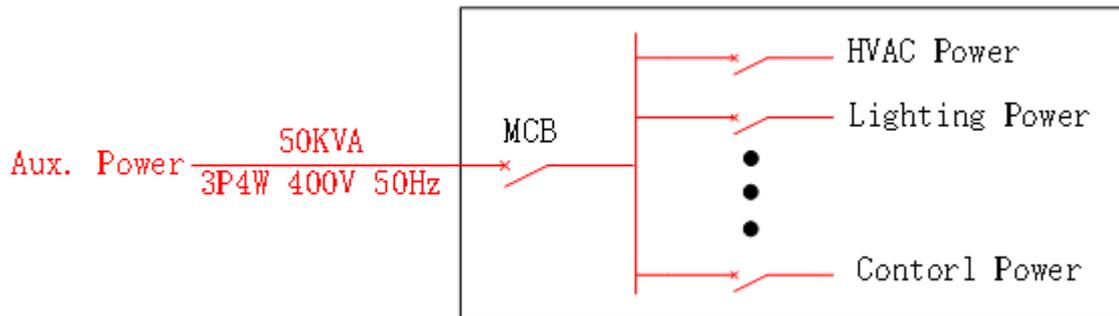
PCS Appearance

Manufacturer		GSSTES
Model		MA1000K60
DC parameters	Maximum voltage [Vd.c.]	1000
	Rated voltage [Vd.c.]	800
	Battery voltage range [Vd.c.]	680~1000
	Maximum charging / discharging current [Ad.c.]	88
AC input parameters	Maximum input apparent power [kVA]	60
	Maximum input active power [kW]	60
	Rated input voltage [Va.c.]	230/400, 3P+N+PE
	Maximum continuous input current [Aa.c.]	86
	Rated input frequency [Hz]	50
AC output parameters	Rated output voltage [Va.c.]	230/400, 3P+N+PE
	Rated output frequency [Hz]	50
	Maximum continuous output current [Aa.c.]	86
	Maximum continuous output active power [kW]	60
	Maximum continuous output apparent power [kVA]	60
	unbalanced loads	100%
	Overload capacity	1.1 1min;1.25s
	Power factor	0.8 un~0.8 ov
General	Operating temperature range [°C]	-30~+60 (>45°C derating)
	Ingress protection	IP20
	Operating altitude range [m]	3000

	Maximum efficiency	98.5%
	AC / DC start function	Integrated
	Size (W*D*H) [mm]	436*550*130
	Weight [kg]	28
Communication	BMS communication interface	CAN、RS485
	EMS communication interface	Ethernet、RS485
	EMS communication protocol	ModbusTCP/ModbusRTU
	general-purpose IO	3-way DI、2-wayDO
Standard	G99、EN50549、EN62477、VDE4105、AS NZS 4777 etc.	

2.4.3 Aux. power

Each Powermount container uses external power supply and provides one 50kVA 400V 3P4W 50Hz external interface, as shown in the following figure.



2.4.4 EMS



Figure 1.2 Energy Management System

General parameters	
Power supply	DC12V,9A
Display	10.1'
Resolution	1366*768

IP protection rating	IP20
Operation humanity	10% ~ 95%
Size (W*D*H)	320mm*60mm*500mm
External interface parameters	
Ethernet	2 × Intel® I210AT GbE LAN ports
USB	4 × USB 2.0 (500mA per each)
SIM	1 × SIM card holder
COM1/2/3	2 × RS485
Antenna	1 × 4G

Local EMS energy management system function:

- **Data acquisition and processing**

The system shall be able to collect and process real-time information through the measurement and control unit, PCS and BMS.

- **Data storage**

Real-time data: Store the real-time data collected by the monitoring system, whose value should be updated continuously according to the real-time changes of the operating conditions, and record the current data of the monitored equipment.

Historical data: Important data that needs to be stored for a long time will be stored in the historical database. A general database shall be provided, and the recording cycle is adjustable from 1 minute to 1 hour each time. Historical data should be able to be rolled and stored online for 3 months without manual intervention. All historical data should be able to be transferred to mass storage devices such as CDs or hard disks as long-term archives.

The stored data includes telemetry over-limit, remote signal displacement, action/fault signal, battery, PCS operation data and other related information.

- **Data display**

Through the HMI touch screen, the collected data information, status information, and fault alarm information are displayed on the touch screen for users to observe the data on site.

At the same time, the touch screen provides a setting interface, which can set the basic parameters and protection parameter values of the energy storage cabinet, including the following settings:

- ✓ Charge and discharge power setting in on-grid mode
- ✓ Working mode setting
- ✓ Control mode setting
- Alarm function

Judgment is made on the collected voltage, current, temperature, etc. If there is an over limit, an alarm signal and a fire alarm signal are sent and SOE information, protection signals, etc. are displayed.

- Statistics

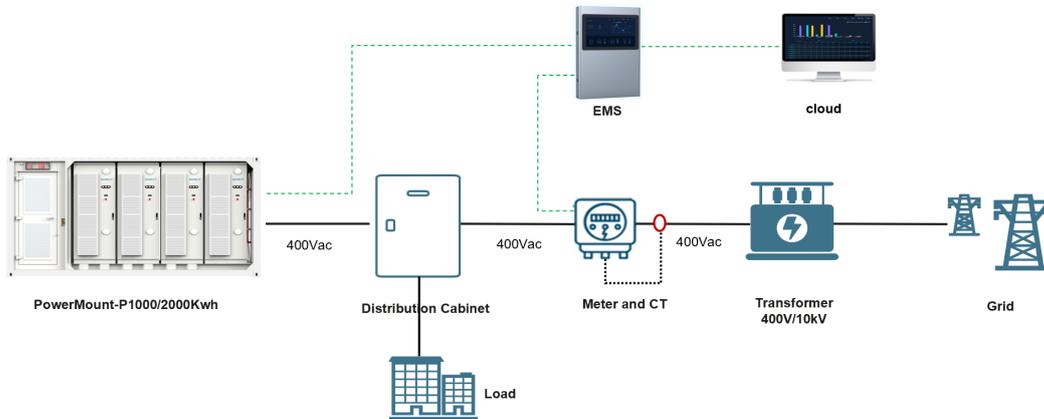
For important data, such as energy storage power, the number of faulty batteries, etc., various statistical methods such as lists, curves, and histograms are provided.

Local EMS energy management system statistics shall include:

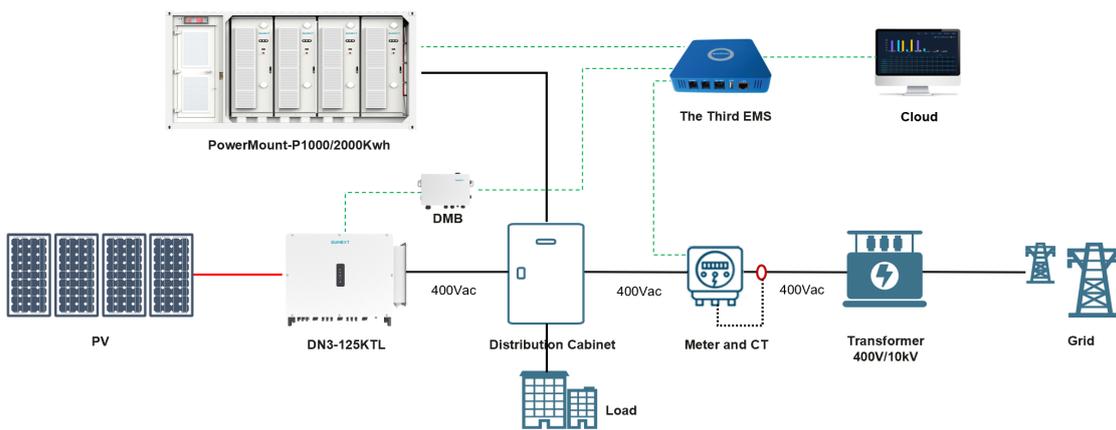
- ✓ The statistical results of the specified data of all energy subsystems in the energy storage station can be viewed, and a specific battery cluster can be selected to view its statistical data.
- ✓ The statistics of measured values include maximum value, minimum value, average value and corresponding time statistics.
- ✓ Local EMS statistics include: statistics on the status of each loop system switch, voltage and current information, and you can view the operating information in each period.

3. Powermount-1MW/2MWh Solution Introduction

3.1 Powermount-1MW/2MWh Solution Diagram



On-grid Scenario: Single PowerMount Pure Storage System



On-grid AC Coupling Scenario: Single PowerMount PV+ESS System

3.2 Advantages of Solution

- **All in One Design:** To simplify on-site installation and wiring, the energy storage system adopts an all-in-one design, integrating the energy storage battery, PCS, and EMS into a 20HQ container. The maximum battery capacity of a single container is 2MWh.
- **PCS output voltage 400V:** The energy storage system can be directly connected to the 400Vac grid without additional transformer.
- **Battery cabinet are with 1h fire Resistance :** To enhance the safety performance of the energy storage system, the battery cabinets inside are connected in parallel.

Each battery cabinet is physically isolated and equipped with independent temperature control and fire-fighting systems. The capacity of each cabinet is 250kWh, and the battery cabinets are with 1h fire resistance.

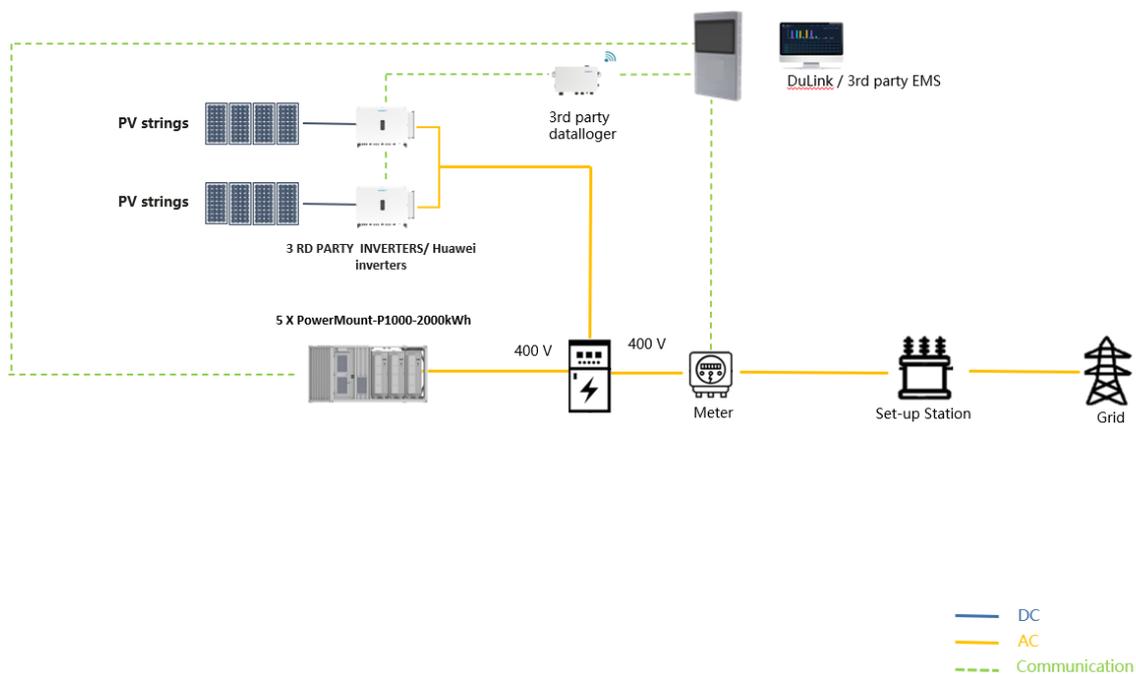
- **Power can Flexibly configuration:** The energy storage system supports flexible capacity configurations. The PCS uses a modular design, with a maximum capacity of 80kW for each PCS module. The number of PCS and battery cabinets can be flexibly combined to achieve various capacity configurations.
- **Support DC Coupling:** Optional MPPT modules are available, supporting photovoltaic DC coupling.
- **Integrated EMS:** The integrated EMS in the energy storage system is an intelligent energy management system enabling applications such as maximizing self-consumption, peak-valley arbitrage, backup power, frequency modulation, and peak shaving.

4. Powermount Technical Proposal

4.1 Solution Configuration

The system consists of 10 sets of 1MW/2MWh Powermount containerized energy storage systems, each Powermount contains 1 20HQ frame container, 8 sets of 250.88kWh outdoor battery energy storage integrated cabinets, 1 set of PCS cabinet (including 18 sets of 55.6kW PCS modules) and 1 set of local EMS.

The output specification of the energy storage system is 3P4W AC400V/50Hz, and the 10 sets of Powermount are connected in parallel to the customer's AC400V grid system. Each Powermount container is equipped with a local EMS for energy management of the entire battery energy storage system. This local EMS can provide the buyer with a Modbus TCP/IP and Modbus RTU communication interface.



4.2 Capacity degradation

Our company guarantees that the rated energy of the product is not lower than the Battery Energy Storage System BOL (FAT charging capacity). Under the preset operating conditions of the battery system, the battery cycle times are 6000, and the EOL is not less than 70% BOL (no more than 2 cycles per day).

The energy attenuation of the battery under the preset operating conditions of the battery system is shown in the following table:

Year	SOH %
0	100.0%
1	92.0%
2	88.5%
3	86.0%
4	83.8%
5	81.6%
6	79.4%
7	77.2%
8	75.1%

Note: The degradation curve of battery may vary under different test conditions.