



## Micro-Grid System



**MEGACUBE 500kW**  
**BATTERY ENERGY STORAGE SYSTEMS**



# MEGACUBE 500kW BATTERY ENERGY STORAGE SYSTEMS

552kWh / 1104kWh / 1656kWh / 2206kWh

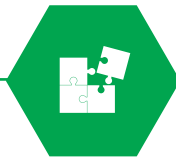
## Product Description

MEGACUBE 500kW Battery Energy Storage Systems have been created to be a install ready and cost effective on-grid, hybrid, off-grid commercial/ industrial battery energy storage systems. 20' and 40' containers.



### Multiple applications

Applications of the MEGACUBE include micro-grid, backup power, peak shaving, time of use bill management, frequency regulation, voltage support, renewable integration, and islanding.



### Ready to fit anywhere

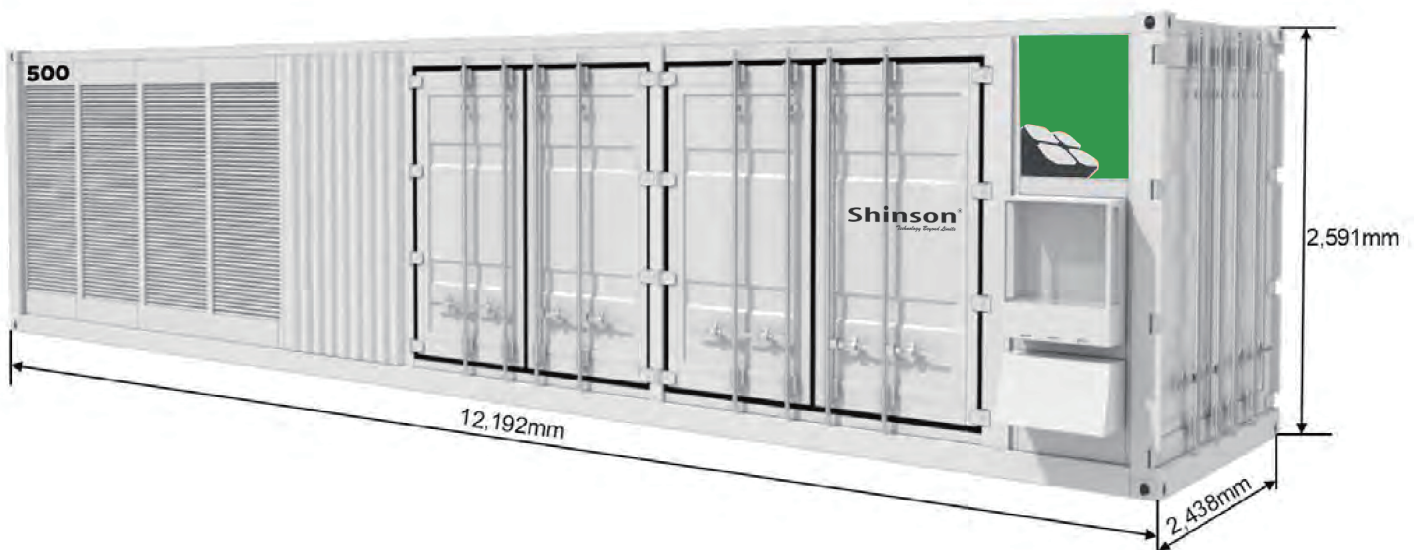
MEGACUBE 500kW battery energy storage solution is the ideal fit for larger scale commercial applications.

Each commercial BESS is manufactured to be install ready.



### The future of solar energy storage

Lithium Iron Phosphate (LiFePO4) battery systems connected at high voltage come with 5000 cycle warranty and up to 80% DOD (Depth of Discharge) @ 1C 25C



'40 foot container



## **Large Scale Li-Ion Battery ESS (LFP) - About**

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Each 500kW ESS is designed and shipped with the batteries pre-installed (20' containers only) utilizing UN 3536 shipping standards. 40' containers require battery packs to be installed on-site.

Each BESS container has a PV inverter making it easy for completing your renewable energy project. Multiple functionality modes allows simple switching between Grid, PV, or Genset enabling better user control and stability.

All system systems are offered in either 400VAC or 480VAC 3 phase.

### **BESS Benefits**

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- Pre-Installed System from Factory (20')
- Simplified Installation
- PV & Genset Ready to Connect
- Demand Charge Reduction
- Energy Independence (w/PV)
- Peak Load Shifting
- Full Back Up Power (Auto Switching)

### **Common Applications**

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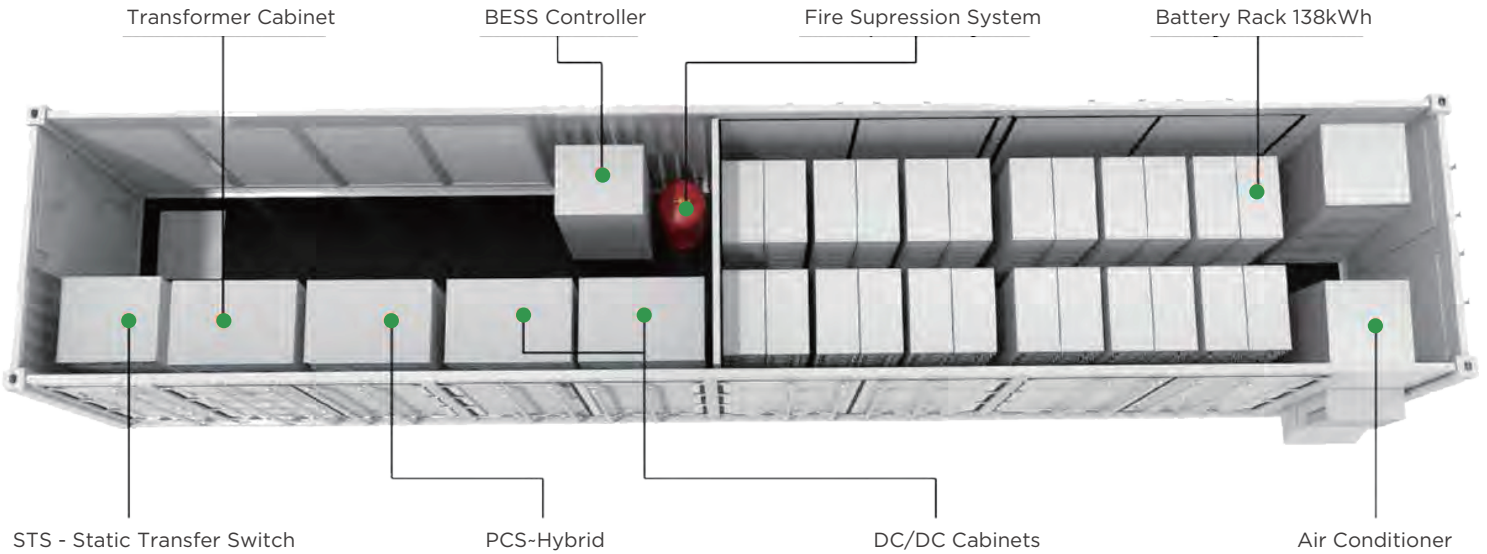
- Microgrid Projects
- Grid Applications
- Business's & Factories
- Shopping & Distribution Centers
- Offices Buildings
- Schools and Libraries
- Island communities
- EV Stations

## MEGACUBE 500kW Battery Energy Storage Systems

Item	S-MGC500-552	S-MGC500-1,104	S-MGC500-1,656	S-MGC500-2,208
<b>DC Data</b>				
Battery chemistry	Lithium Iron Phosphate (LFP)			
Cell life cycle	80% Retention with 5,000 Cycles @1C 25°C			
Cell spec	3.2V/90Ah			
String configuration	2P240S			
Number of strings	4	8	12	16
Rack rated energy capacity	138kWh			
DC rated energy capacity	552kWh	1,104kWh	1,656kWh	2,208kWh
Rated voltage	768V			
Voltage range	672V-852V			
BMS communication interface	RS485, Ethernet			
BMS communication protocol	Modbus RTU, Modbus TCP			
<b>AC Data</b>				
Rated AC power	500kW			
Maximum AC power	550kW			
Rated voltage	400V/480V	400V/480V	400V/480V	400V/480V
Grid voltage range	315%/310%			
AC rate of current	720A/601A			
Output THDi	≤3%			
Adjustable PF	1(leading)-1(lagging)			
Grid frequency range	50/6032.5Hz/59.5-60.5Hz			
Isolation method	3 Phase 4 Line Transformer			
<b>General Data</b>				
Dimension w/o clearances (L*W*H)	6,058*2,438*2,591mm	12,192*2,438*2,591mm	13,716*2,438*2,591mm	
Weight of the whole system	<16t	<26t	<30t	<40t
Degree of protection	IP54			
Operating temperature range	-20-40°C			
Relative humidity	0-95% (non-condensing)			
Max working altitude	3,000m/9,842ft			
Cooling concept of DC hatch	HVAC			
Communication interfaces	RS485, Ethernet, GPRS			
Certifications	UL1973, UL9540A, IEC62619, CE , UN38.3			

## MEGACUBE 500kW Battery Energy Storage Systems

Product Series	Part #	Energy (kWh)	PCS Power (kW)	Max PV (kW)	PV Voltage Range (V)	PV MPPT Inputs	Battery String	Number of Strings	Battery String (V)	DC/DC Converter (kW)	STS (kW)	Dimension w/o clearances (L*W*H) (mm)	Container Size (feet)
S-MGC500	M500-552	552	500	560	250 to 672	8	M138-15P9	4	768	400	800	6058 x 2438 x 2591	20'
	M500-1104	1104						8				12192 x 2438 x 2591	40'
	M500-1656	1656	500	560				12				13716 x 2438 x 2591	45'
	M500-2208	2208						16					



### BESS's Include:

- Battery Racks & Wiring (LFP)
- BESS Controller with Battery Management System
- High Voltage Units (BMS)
- 500kW Power Conversion System (PCS) (DC/AC)
- 400kW DC/DC Converter
- 500kW Transformer
- 800kW STS (excludes N/A systems)
- 20 & 40 foot Storage Container
- HVAC System
- Fire Suppression System
- Installation Manuals, Certificates, Usage Guide, etc.

## MEGACUBE 500kW Battery Energy Storage Systems

Item	Data
Battery module	S138-15P9
Pack QTY	15 (6-15 Configurable)
Nominal capacity	138kWh (64-138kWh)
Discharge cutoff - rated voltage - charge cutoff voltage	672V - 768V - 852V
Pack	3.2V/90Ah@2P16S
String measuring voltage range	100-1,000V
String voltage detection accuracy	30.5%
String voltage sampling period	100ms
String measuring current range	+/-300A
String current detection accuracy	≤1%
SOC calculation accuracy	≤7%
Input insulation resistance	≥10MΩ, 1,000V DC
Communication	Modbus TCP, CAN, Modbus RTU
System cycle life	≥5,000 cycles @ 1C, 25C
Dimensions (W*D*H)	800*750*2,050mm
Weight	1,430kg
Certifications	UL1973, UL9540A, IEC62619, CE , UN38.3



### Battery String-S138

- 1C Charge/Discharge
- The energy supply can be a single battery string or parallel battery strings
- Easy configuration and maintenance

Item	M500-EX	M500-NA
Battery voltage	600-900V	630-900V
DC Max current	873A	
Rated AC power	500kW	
Maximum AC power	550kW	
Rated voltage	400V	480V
Grid voltage range	315%	310%
AC rate of current	720A	601A
Output THDi	≤3%	
Adjustable PF	1(leading)-1(lagging)	
Grid frequency range	50/60±2.5Hz	59.5-60.5Hz
Isolation method	3 Phase 4 Line Transformer	
Dimensions (W*D*H)	2,200*800*2,160mm	
Weight	2,000kg	



### Power Conversion System

- Single-stage three-level modularization
- Multi-branch input to reduce battery series and parallels connection
- PV, DGEN, and Grid ready

## MEGACUBE 500kW Battery Energy Storage Systems

Item	Data
LV PV input mode	
HV DC bus voltage	LV voltage+40V-850V
HV DC bus current	0-100A*8
LV PV input voltage	250-840V
LV PV input current	0-120A*8
Power rating	50kW*8
Dimensions (W*D*H)	1,100*800*2,160mm
Weight	600kg



### DC/DC Converter

- Bi-direction DC-DC converter
- Field-replaceable units with modular design
- Shared or separated DC bus

Item	Data
Rated power	800kW
Rated voltage	400V
Input voltage range	-25%-15%
Output voltage range	-25%-15%
Rated input current	1,155A
Max input current	1,270A (110%)
Frequency range	50/6034.5Hz
Switching time	10ms-80ms
IP degree	IP20
Efficiency	99.5% (Full load)
The max load standing capacity during switching	300kW (RCD type, pure capacitive load or inductive load < 100kvar)
Wiring mode	3 Phase 4 Wire
Dimensions (W*D*H)	800*800*2,160mm
Weight	450kg



### Static Transfer Switch

- Integrated distribution cabinet function for distributed power access
- Millisecond on/off-grid switching
- Automatic operation, switching
- 15-inch display screen, for operation monitoring

## MEGACUBE 500kW Battery Energy Storage Systems



**Battery Pack-P9**



TCP / RS485

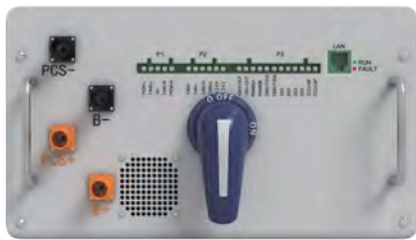


TCP / RS485



Life span >5,000 cycles @ 1C 25C

Item	Data
Capacity (kWh)	9.216kWh
Rated voltage	51.2V
Discharge cut-off voltage	44.8V
Charge cut-off voltage	56.8V
Cycle life	>6,000 cycles@0.5C 25°C
Voltage detection accuracy of battery cell	310 mV
Temperature detection accuracy of battery cell	±2°C
Balancing current of battery cell	≥150mA
Range of voltage measurement for battery cell	1-5 V
Battery balancing method	Passive balancing
Certifications	UL1973, IEC62619, UN38.3



**M138-HVU**



Multistage protection



Rich interface



Dual-channel power supply

Item	Data
Circuit breaker	160A-250A
Hall sensor	300A
Leakage current sensor	50mA
Fuse	250A
Error range of voltage detection accuracy	31%
Error range of Current detection accuracy	31%
Temperature detection accuracy	±2°C
Operating life	10 years
Certifications	UL1973



**BESS Controller**



Pre-engineered control strategy



Easy configuration

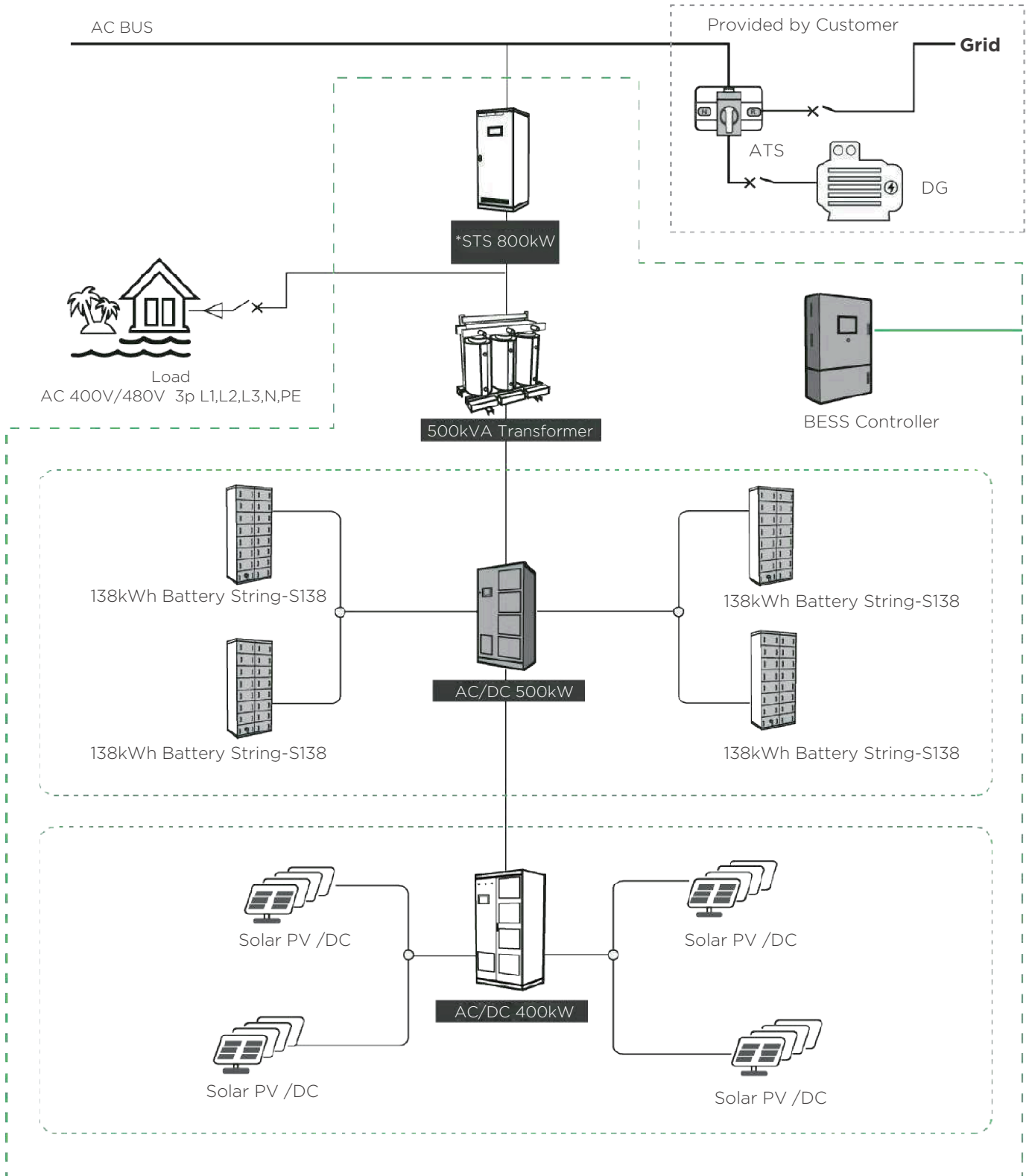


Cloud base data communication

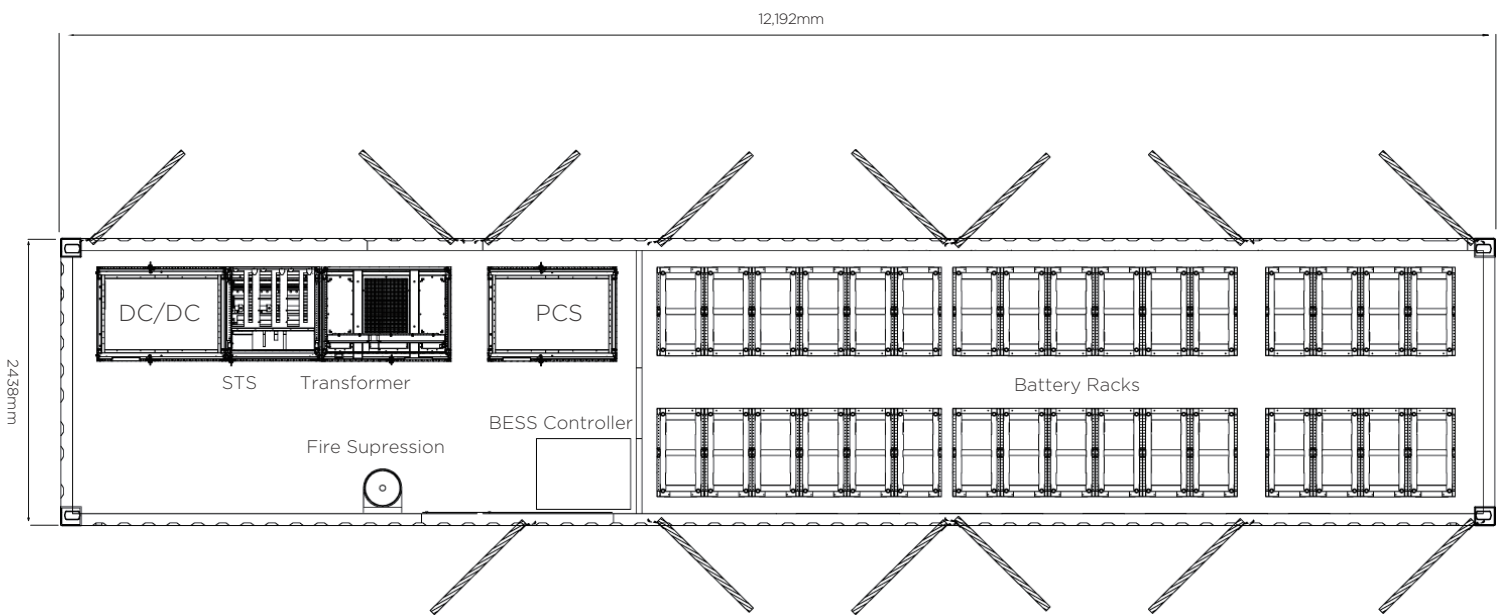
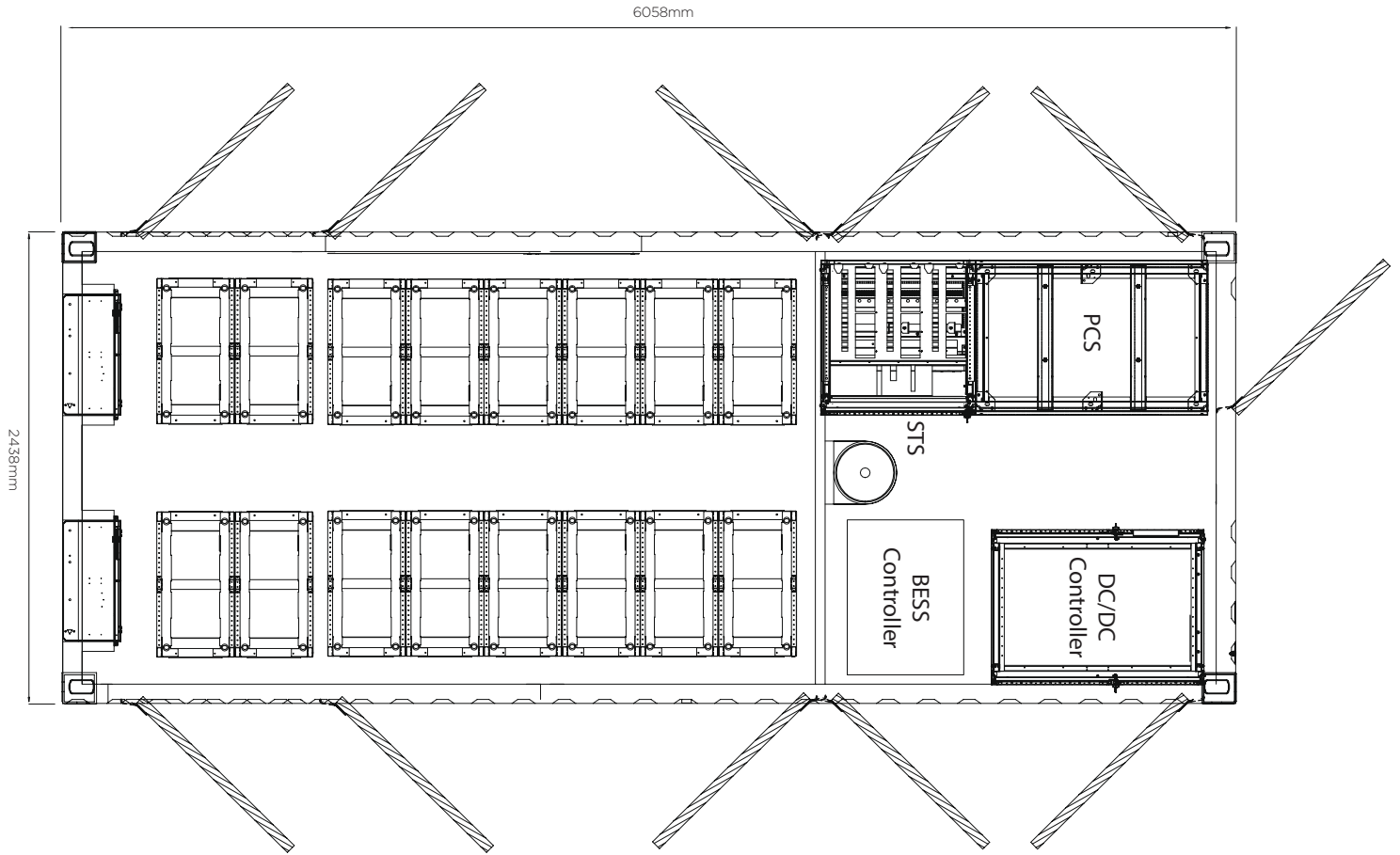
Item	Data
Dimensions (L*W*H)	600*700*2,200mm
Weight	200kg
Protection Level	IP20
Operating Temperature	0°C-40°C
Memery	dual-core micro-controller 64M RAM 128M flash memory
Network	Safety zones divided by network switches and firewalls
Power Consumption	<100 W
Backup Time	30 minutes (optional)
HMI	15" LCD touch screen



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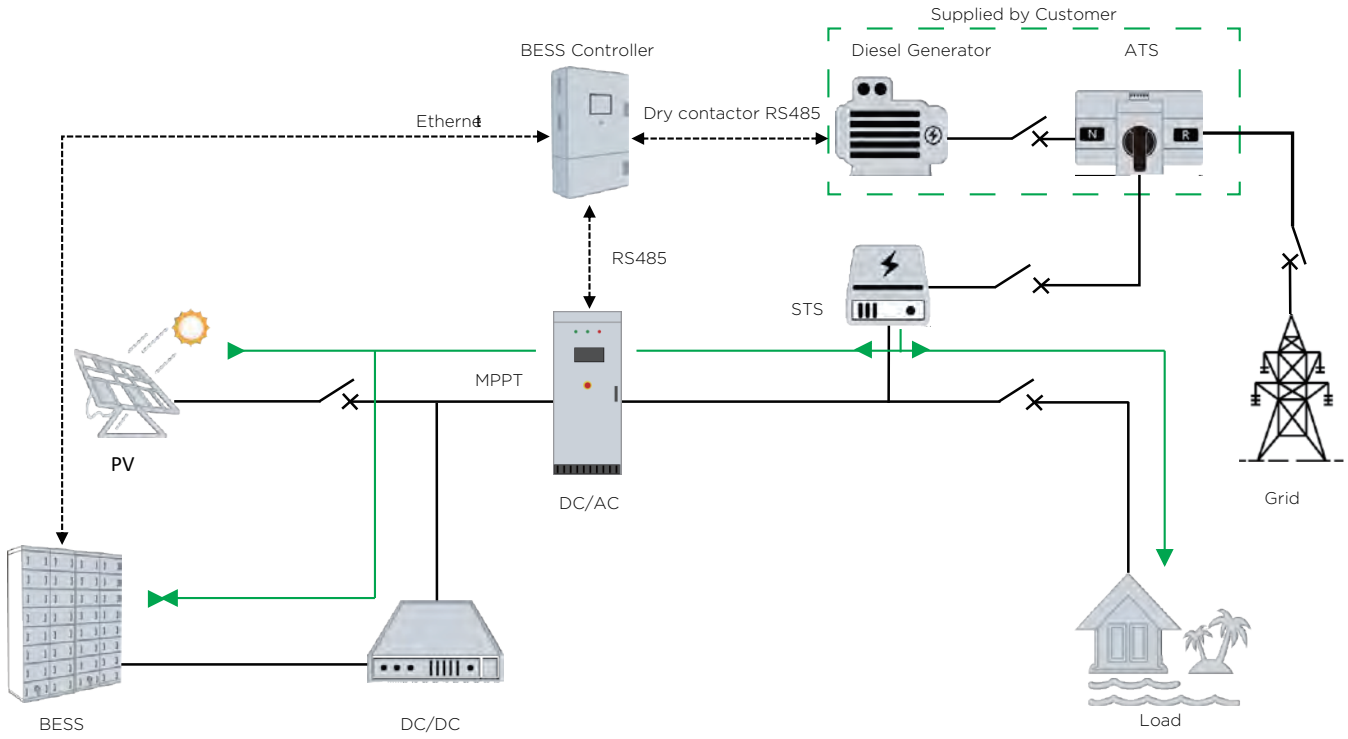
# MEGACUBE 500kW Battery Energy Storage Systems



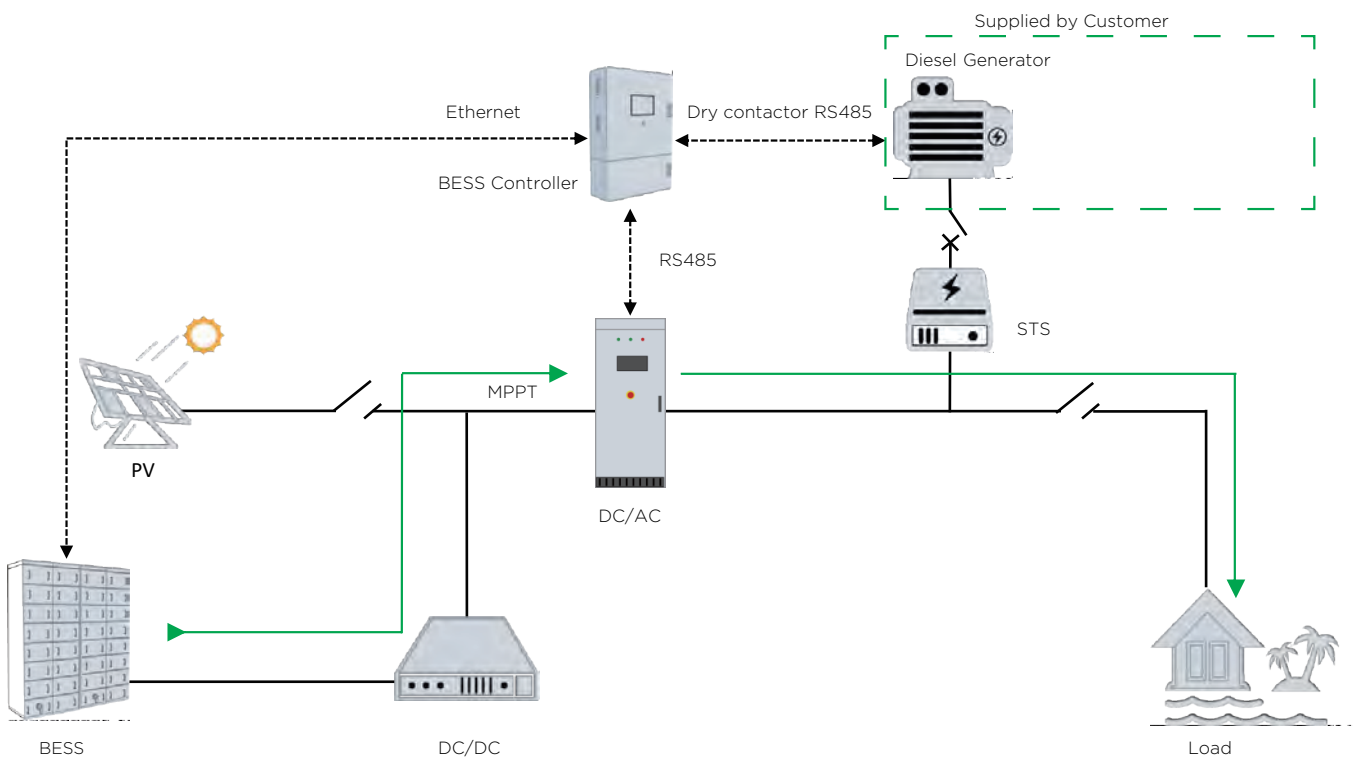
40 Foot

# MEGACUBE 500kW Battery Energy Storage Systems

## 1. PV & BESS Operation Off-Grid/Microgrid

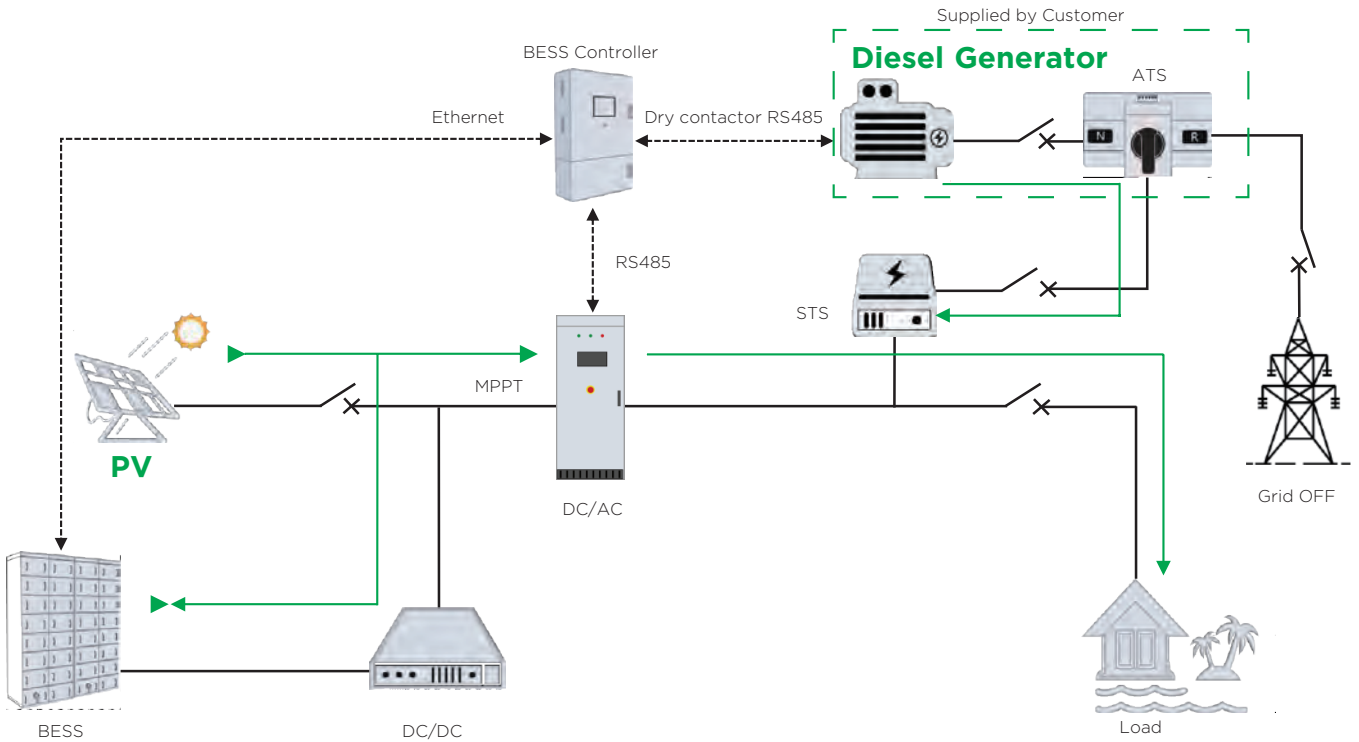


## 2. BESS Power Operation Off-Grid/Microgrid

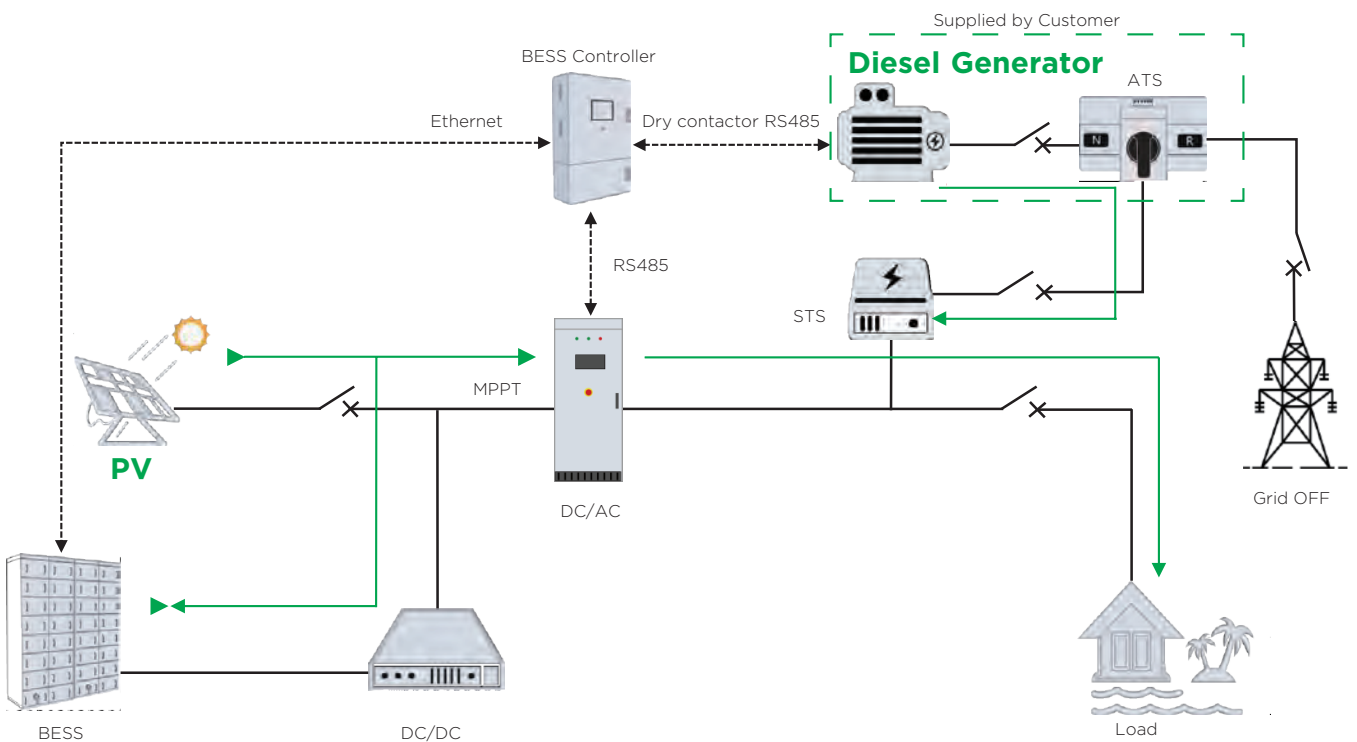


## MEGACUBE 500kW Battery Energy Storage Systems

### 3. Diesel Gen Power Operation Off-Grid/Microgrid

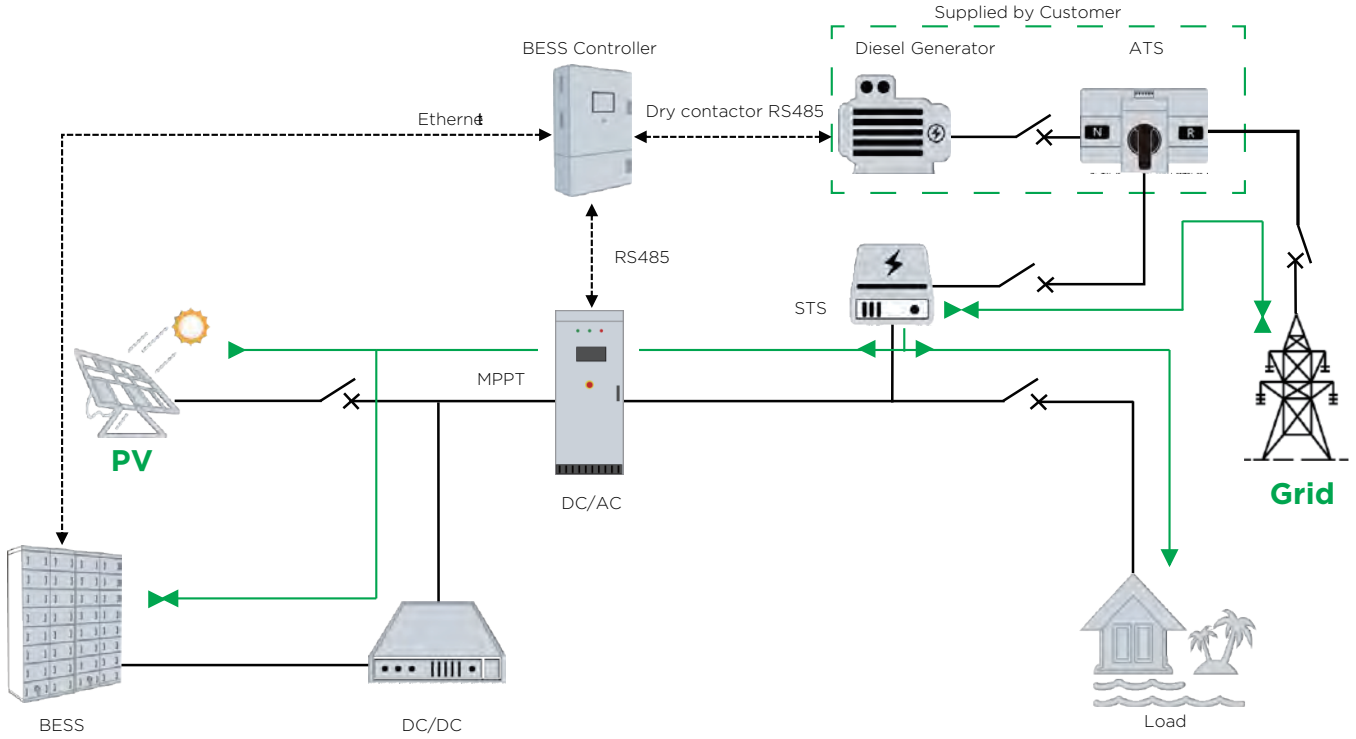


### 4. PV + Genset Operation Hybrid/Microgrid

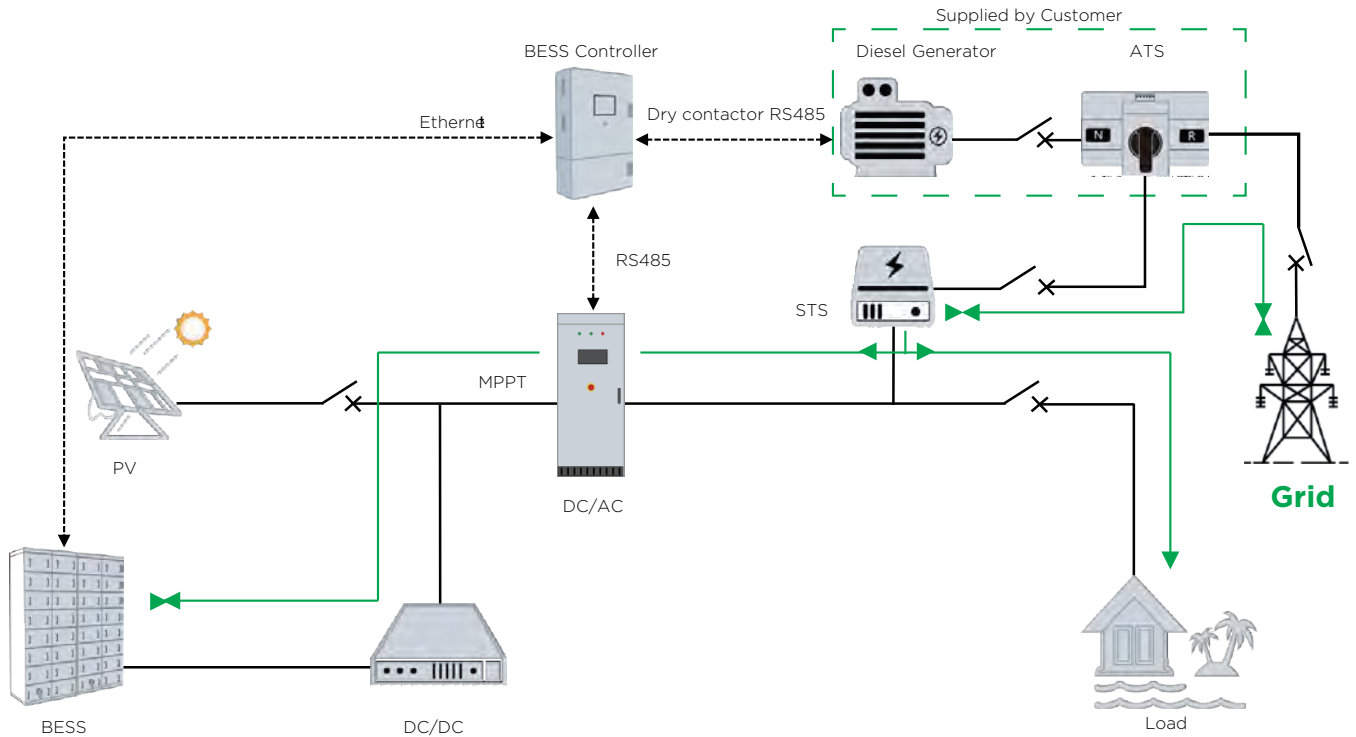


# MEGACUBE 500kW Battery Energy Storage Systems

## 5. PV + Grid Operation Hybrid/On-Grid



## 6. Grid Operation Hybrid/On-Grid





## BESS System Monitoring

A cloud based energy management system (EMS) monitors the loads at the PV power station, grid access point, and at the energy storage systems grid access point in real-time.

By monitoring real-time data, and taking safety & stability constraints into consideration, the cloud based EMS can dynamically adjust the energy storage system's charge/discharge strategies.





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