Utility & Industrial Solutions

Storage Container Range

5 Years
Guarantee on Product Material & Workmanship

12 Years
Energy Output Warranty

The Containerized Battery Energy Storage Solution (BESS) is an advanced Lithium-Iron storage unit built into a customised 20ft or 40ft container. The unit is designed to be fully scalable to meet your storage requirements. Storage size for a containerised solution can range from 500 kWh up to 6.528 MWh per container. This solution can be a pure storage solution or integrated with various Power Conversion Systems (PCS) from 250kW+ output power.

Solar MD combines and integrates these storage systems according to the project specific needs. The solution can combine various sources of energy through diesel powered generators or renewable power sources.

Features

- **High energy density**
- **Quick Installation**
- **Scalable Design**
- **Engineered & Tested For Harsh Environments**
- **Advanced Battery Management**
- **Excellent Safety & Fire Protection Features**
- **High charge & discharge rate**
- **Pre-commissioned & Tested**
- **Unmatched Reliability & Low Maintenance**
- **Field Replaceable Modular Components**
- **Stable discharge platform**
- **Long life cycle**
- **Green technology**
- **Remote Technical Support**

Applications

- Utility Scale Grid Balancing
- Mini-Grid Solutions
- Energy Arbitrage
- Peak Shaving
- Production Facilities & Retail Stores
- Large-scale Agricultural Facilities
- Virtual Power Plant Integration & Ancillary Service Trading
- Commercial Hybrid & Off-Grid Power Back Up
- Industrial Water Pumps

Safety & Reliability

The solution is produced with the world-leading CATL LiFePO4 technology, known for its world-class performance. We include a 12-year of battery performance warranty and a 5-year guarantee on the container and workmanship.

Every solution boasts a state-of-the-art cooling system, keeping the battery operating at optimal temperatures for peak performance and longevity. Each solution includes a fire suppression system which acts as a fail-safe, providing an extra layer of security.

Cell Chemistry	Lithium Iron Phosphate (LiFePO4)
Cell Manufacturer	CATL
Cell Certification & Standards	IEC 62619 / UN38.3 / UN3480/ UL1642/ CE
Cycle Life @25°C	≥7000
Recommended depth of discharge (DoD)	90%
Container Round Trip Efficiency	> 93% (Battery Only)
Container Ambient Temperature	-10°C to 50°C (-30°C on request)
Container Thermal Insulation	Rockwool
Protection Class	IP65
Container Safety Standard	IEC 62933-5-2:2020
Fire Protection	Fire Pro (Eco Friendly - K2 CO3)
Climatization	2x 36000 BTU Air Conditioners
Energy Management System	mypower24 Plant Controller

5 Years **Container & Battery** Workmanship Guarantee

12 Years **Battery Performance** Warranty

Variations

20ft Battery Only

Our 20ft battery only container has a **maximum capacity of 2.7 MWh** utilising 170x SS6160 High Voltage battery modules (10x SS70xx racks) connected in series and battery racks connected in parallel.

40ft Battery Only

Our 40ft battery only container has a **maximum capacity of 6.5 MWh** utilising 408x SS6160 High Voltage battery modules (24x SS70xx racks) connected in series and battery racks connected in parallel.

20ft Battery & PCS (incl. Transformer)

Our 20ft battery & inverter variation has a **capacity range of 0.5 - 1 MWh** utilising max. 64x SS6160 High Voltage battery modules (4x SS70xx racks) with **250 - 500KW output power** inclusive isolation transformer.

40ft Battery & PCS (incl. Transformer)

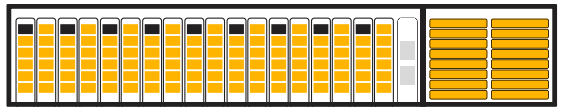
Our 40ft battery & inverter variation has a **capacity range of 2 - 3 MWh** utilising max. 192x SS6160 High Voltage battery modules (12x SS70xx racks) with **1 - 1.5MW output power** inclusive isolation transformer.

20ft Battery & PCS (excl. Transformer)

Our 20ft battery & rack PCS variation has a **maximum capacity of 2.2MWh** utilizing 136x SS6160 High Voltage battery modules (8x SS70xx racks) and up to 8x 125kW PCSs (excl. isolation transformer) for max. **1MW output power**.

40ft Battery & PCS (excl. Transformer)

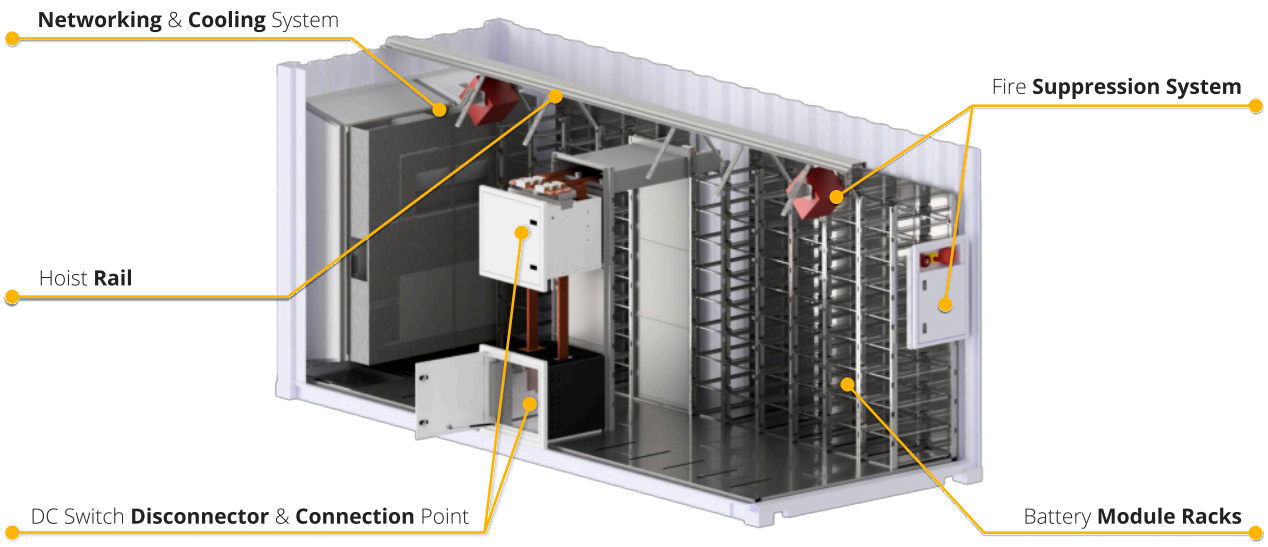
Our 40ft battery & rack PCS variation has a **maximum capacity of 4.9MWh** utilizing 306x SS6160 High Voltage battery modules (18x SS70xx racks) and up to 18x 125kW PCSs (excl. isolation transformer) for max. **2.25MW output power**.



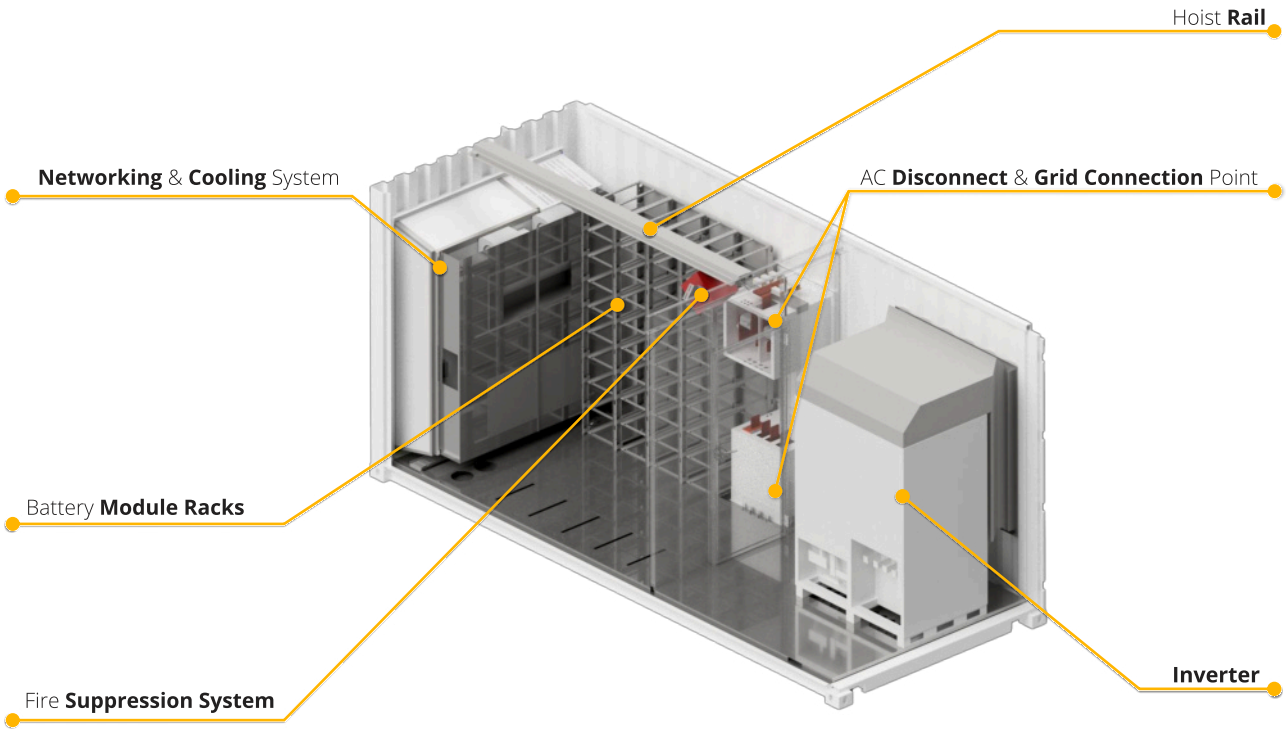
VARIATION	Capacity Range	Inverter Power (PCS)	Battery Nominal Power @ 0.5C	Operational Voltage Range	DC Max. Current	No. of Battery Modules	No. of Battery Racks	AC Output Voltage	Dimensions (W x D x H)	Total Weight
20ft Battery Only	2.7 MWh (Max)	-	1.3 MW	761.6 - 945.2Vdc	1570A	170 x SS6160 - 16kWh	10 x SS70xx	-	6058 x 2440 x 2890 mm	Max. 24 637 kg
40ft Battery Only	6.5 MWh (Max)	-	3.2 MW	761.6 - 945.2Vdc	3000A (higher on request)	408 x SS6160 - 16kWh	24 x SS70xx	-	12200 x 2440 x 2890 mm	Max. 58 250 kg
20ft Battery & PCS (incl. Transformer)	0.5 - 1 MWh	250 - 500kW	0.25 - 0.5 MW	582.4 - 896Vdc	628A	max. 64 x SS6160 - 16kWh	4 x SS70xx	400V	6058 x 2440 x 2890 mm	Max. 17 862 kg
40ft Battery & PCS (incl. Transformer)	2 - 3 MWh	1 - 1.5 MW	1 - 1.5 MW	582.4 - 896Vdc	1884A	max. 192 x SS6160 - 16kWh	12 x SS70xx	400V	12200 x 2440 x 2890 mm	Max. 35 812 kg
20ft Battery & PCS (excl. Transformer)	2.2 MWh	1MW	1.1 MW	761.6 - 945.2Vdc	1256A	136 x SS6160 - 16kWh	8 x SS70xx	400V	6058 x 2440 x 2890 mm	Max. 20 520 kg
40ft Battery & PCS (excl. Transformer)	4.9 MWh	2.25 MW	2.45 MW	761.6 - 945.2Vdc	2826A	306 x SS6160 - 16kWh	18 x SS70xx	400V	12200 x 2440 x 2890 mm	Max. 41 920 kg

[1] Total system weight on site. Shipping weight and packaging sizes will change according to transport (sea/road) weight limitations.

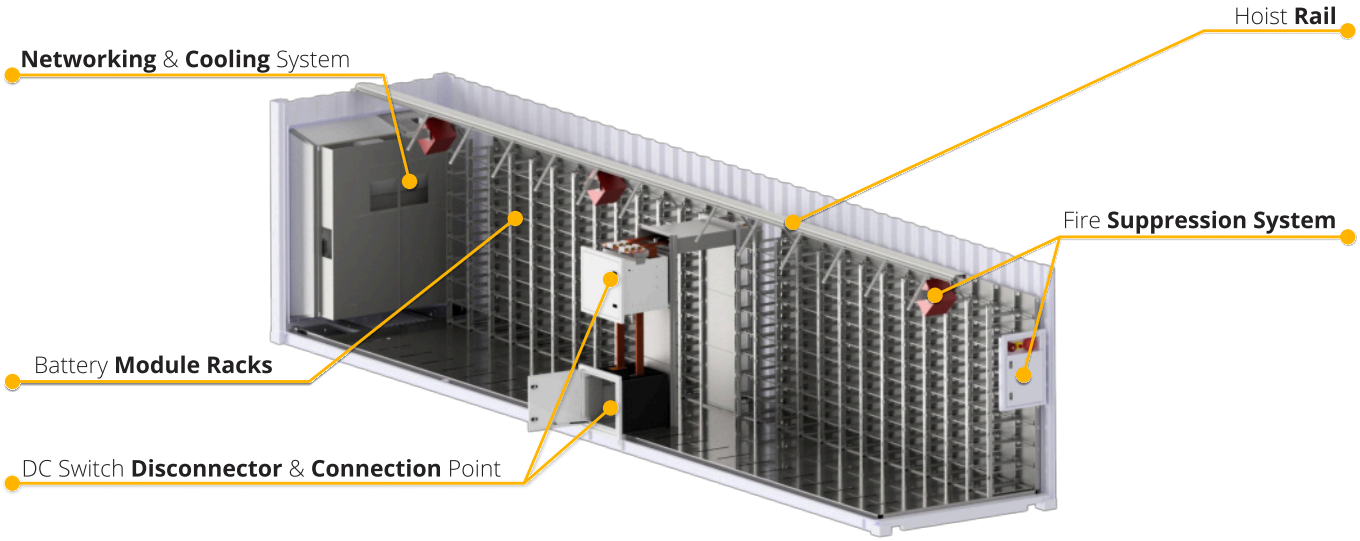
20ft Battery Only



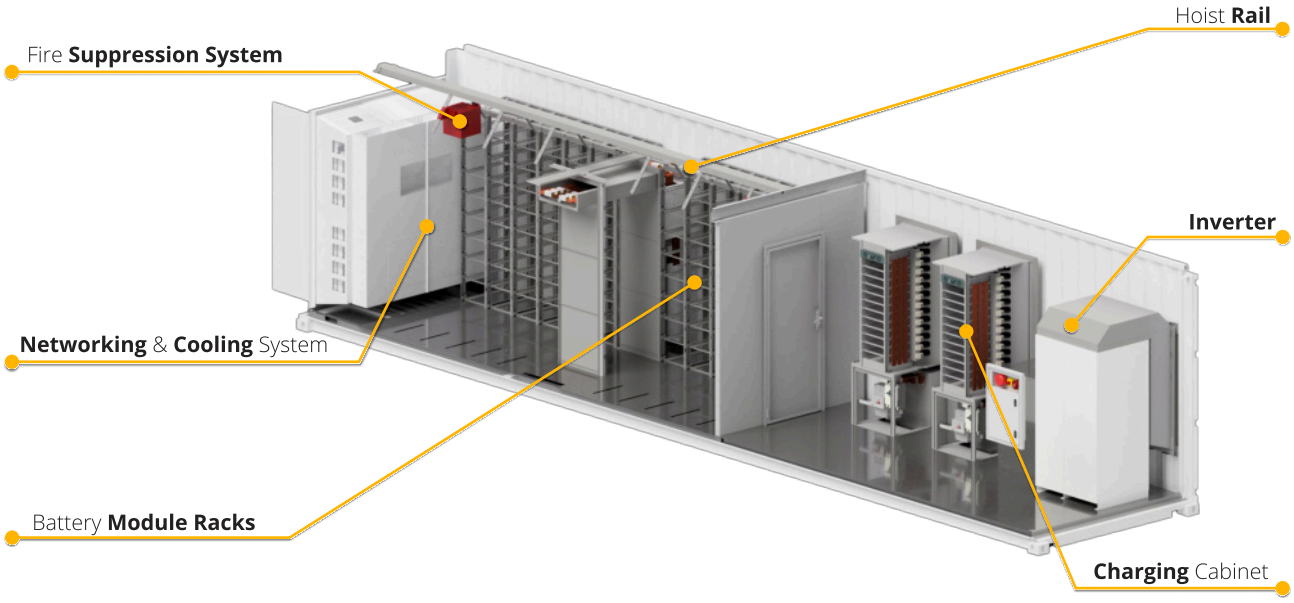
20ft Battery & Inverter



40ft Battery Only



40ft Battery & Inverter



Energy Management System

System Level Management

The Energy Management System (EMS) is a comprehensive solution designed to monitor, control, and optimize the energy consumption and production of all connected systems.

The EMS integrates seamlessly with various brands and devices, including energy meters, generators, and inverters. This capability enables real-time adjustments to energy consumption and production, empowering you to make informed decisions for optimal system management. Regular reports provide insights into energy consumption, cost savings, and environmental impact.

Features:

- Remote Control
- Solar Inverter Integration
- Generator and Alternative Sources
- Energy Arbitrage (Integration with local energy exchange)
- Energy Management
- Peak Shaving
- Mini-Grid Management
  Free access - No monthly fee

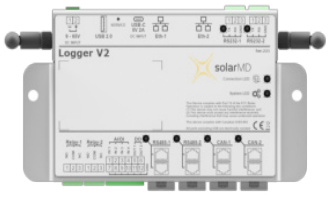
Battery Level Management

Each battery module features a sophisticated Battery Management System (BMS). This system seamlessly communicates with the Battery Management Unit (BMU) to ensure optimal performance and safety.

Key functionalities include:

- Precise cell voltage measurement
- Cell balancing for extended lifespan
- High voltage management to prevent damage
- Data collection and storage for monitoring
- Efficient charging and discharging control
- Built in temperature sensors for optimal thermal management

Monitoring & Control



Logger V2 (The Device)

The High-Performance Logger V2 offers easy and fast communication with automatic device discovery and connection.

- **Interfaces** include CAN Bus, RS232, RS485, Ethernet, and Wi-Fi (client and station).
- Integrated **programmable relays,** digital inputs, digital outputs, analogue input, analogue output for load control.
- **Communicates with** supported inverters, energy meters, weather stations, and other energy devices.

mypower24 (The Platform)

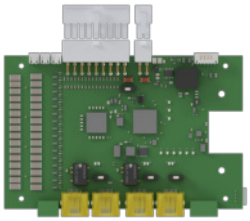
mypower24 is a comprehensive management platform designed to simplify and centralise the control of your energy devices. Seamlessly integrating with your Logger V2, mypower24 offers a robust suite of features that effectively manage and optimise your energy infrastructure:

- **Real-Time Data & Insights:** Gain valuable insights into your energy usage with real-time data visualisation and historical records.
- **Safe & Secure:** High-security standards via certified authentication and encrypted data transfer.
- **Convenient Remote Management:** Remotely manage your system & devices for maximum efficiency.

Each battery module features a sophisticated **Battery Management System (BMS)**. This system seamlessly communicates with the **Battery Management Unit (BMU)** to ensure optimal performance and safety in high-voltage energy storage systems.

- **Data collection & storage for monitoring**
- **Efficient charging & discharging control**
- **Precise cell voltage measurement**
- **Built in temperature sensors**
- **High voltage management to prevent damage**
- **Cell balancing for extended lifespan**
- **SOC Calculation & Control**
- **CANBUS & RS485 Communication**

Battery Management System



Each Solar MD battery, whether low or high voltage, has its own Battery Management System (BMS) designed and built in-house. The BMS handles the internal functions of each battery.

In setups with multiple batteries, the BMS independently manages each one, ensuring a stable energy flow throughout the battery system. In a high-voltage system, the BMS communicates with the Battery Management Unit (BMU), which consolidates all the information and relays it to the mypower24 portal.

BMS-EX

Input Voltage	12 - 65 VDC
Status Indication LED	Status/Warning/Error
Main Dip Switch	on/off
Communication Ports	CANBUS 1 CANBUS 2 / RS458 Ethernet
Relays Isolated (200V- 0.2A)	2
Dimensions W x H x D	130mm x 170mm x 40mm
Weight	0.1 kg
Certification	CE / IEC61000

Battery Management Unit

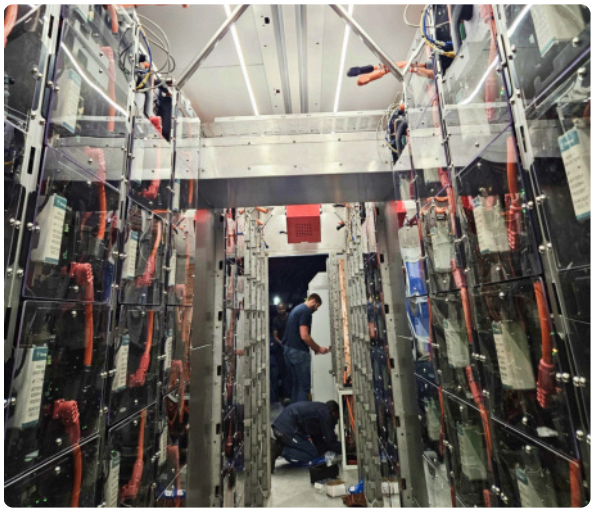
The BMU is used in combination with the SS6143 & SS6160 modules and forms part of our high-voltage energy system. It is responsible for gathering data from the entire battery system, performing state of charge (SOC) calculations, and facilitating information exchange among the various battery modules in its cluster.

It ensures the safe and reliable operation of the entire energy storage system. Additionally, the BMU handles communication with external devices, such as PCS, HPS, and chargers.

BMU-H17-01

Operational Voltage	250 - 1000V DC
Max current	200A
Module output connectors	50mm² (70mm² Containerized solution)
Module input connectors	50mm²
Positive and negative fuse	1500VDC, 200A
Mechanical isolator	1500V, 250A
Power Consumption	2W (Standby) 7.6W (Max)
Communication Ports	CANBUS 1 CANBUS 2 CANBUS 3 / RS458 Ethernet
Dimensions	416.6mm x 361.7mm x 225.8mm
Weight	18.8kg

References



Poultry Production Processing Facility

Located in Potchefstroom, this **large-scale egg production facility** was founded in 1955 and plays a crucial role in supplying hundreds of thousands of eggs each week to South Africa's top supermarket chains.

This project presented a unique challenge: designing a **scalable energy storage** solution that could adapt to the client's evolving needs. The final design features a modular system with **two battery containers** and **two separate inverter containers** to manage the diverse energy sources feeding into the system. This "stacked" configuration optimizes performance and **allows for future expansion** of **storage capacity** as the client's demands increase.

To address the client's requirement for scalable energy storage, the solution utilized four 40ft containers arranged in a stacked configuration. Two of these containers provide energy storage with a total capacity of 4.8MWh, expandable to 11.6MWh.

ENERGY STORAGE SOLUTION

4.8MWh Energy Storage In **Dual Stacked 40ft** Battery Only Containers **(Expandable To 11.6MWh)**

INVERTERS & CHARGING

4 X Sungrow SC1375UD
2 X Kehua Tech STP 250 (DC-DC Converter) Transformer

Contact Us

021 555 2181

081 555 2181

Info@solarmd.co.za

solarmd.co.za