

SOLAR MD

PRODUCT WEBINAR 2024

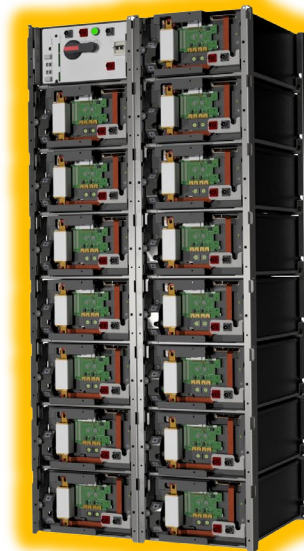
SS4083



SS4143



SS70xx range



Solar MD BESS



Contents:

- Solar MD Overview
- Product range
 1. Low Voltage Battery range
 2. High Voltage Battery range
 3. Logger V2
- My Power 24 Portal Demo
- BESS overview



Company overview:

Vision: Bring affordable, clean energy to every African home without power grid access

|-- Founded Solar MD in 2014

- | |-- Focus on efficient battery systems for renewable energy storage
- | |-- Concentrated on high-capacity storage for energy needs

|-- Developed battery control tech and monitoring system

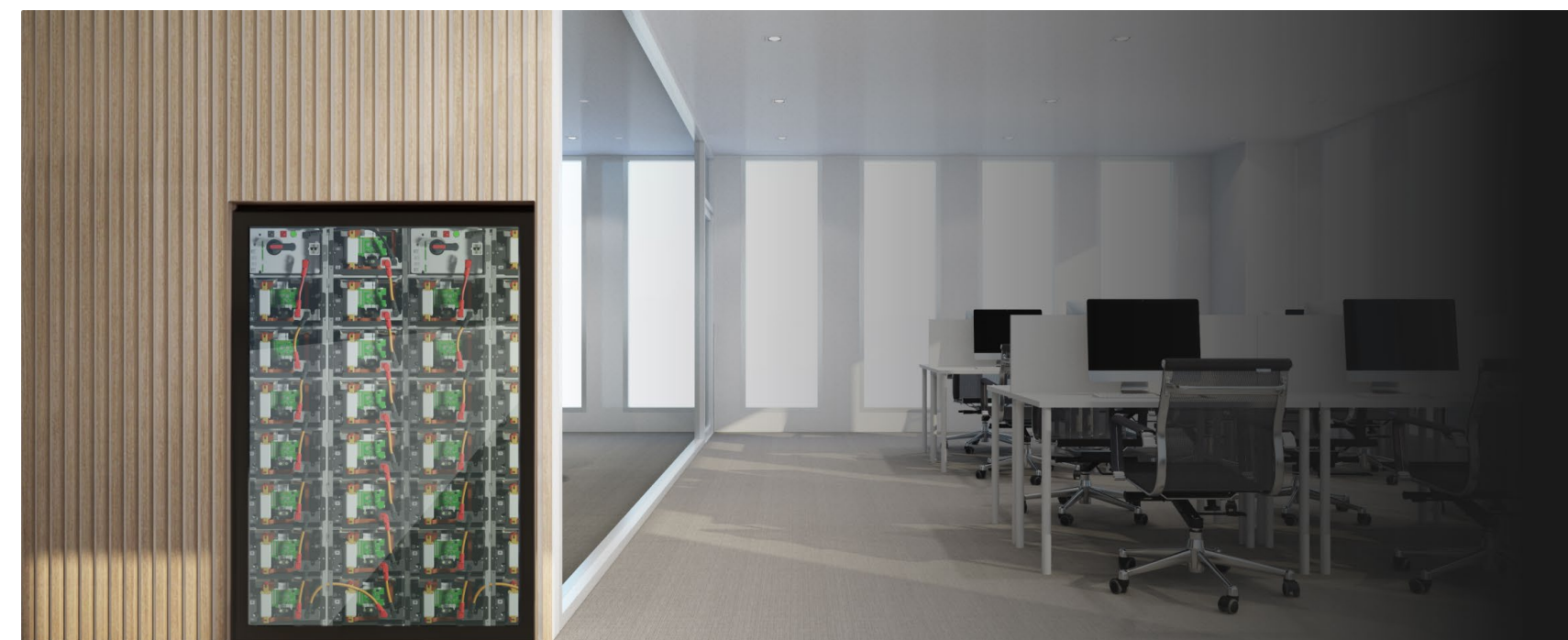
- | |-- Ensures durability and cost-effectiveness

|-- Disruptive battery management system

- | |-- Quick ROI for residential, commercial, and industrial storage

|-- Currently producing and delivering:

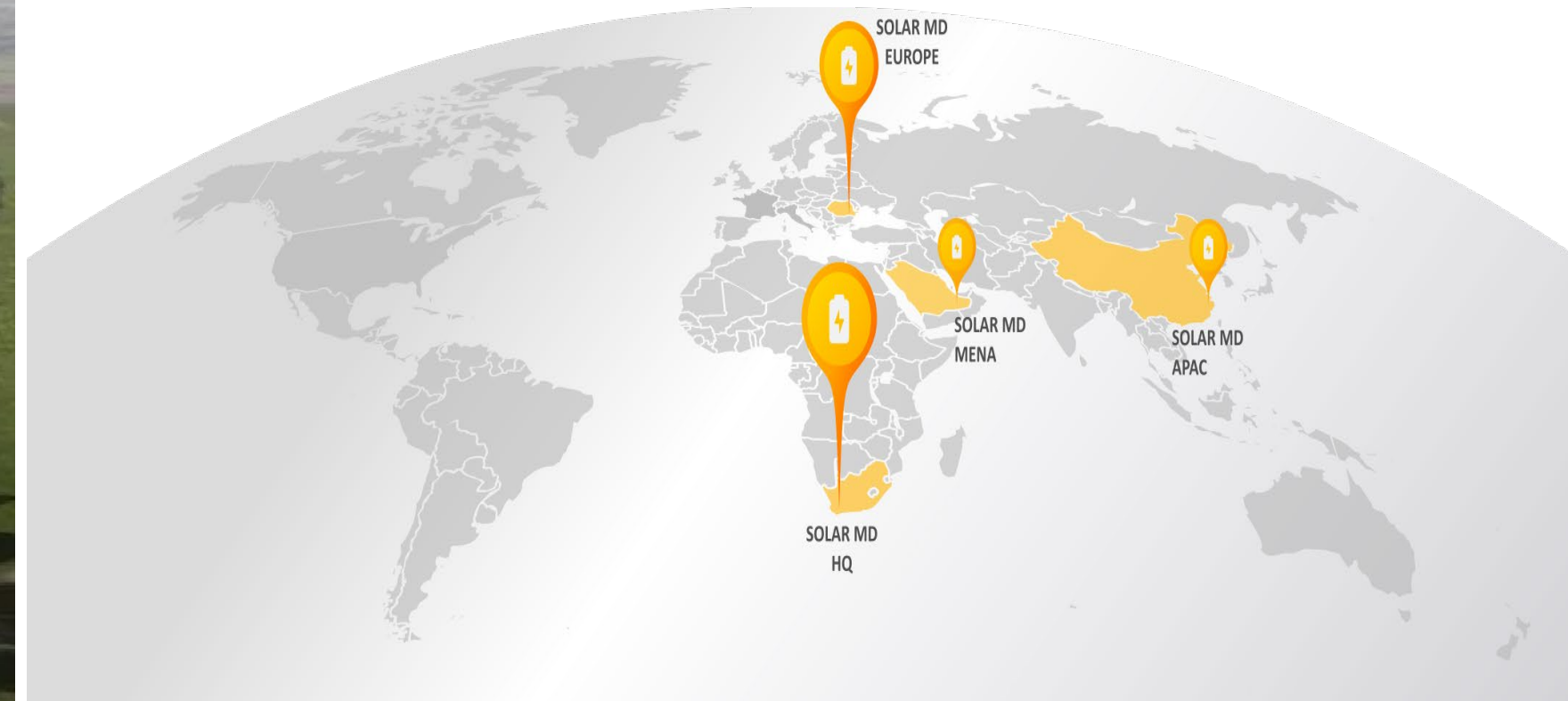
- | |-- Residential and commercial storage solutions
- | |-- Across Africa



Solar MD HQ:



Solar MD HQ
Cape Town, South Africa



Global Presence:



3X
Annual Revenue Growth

50+
Countries

1300 MWh+
Shipment

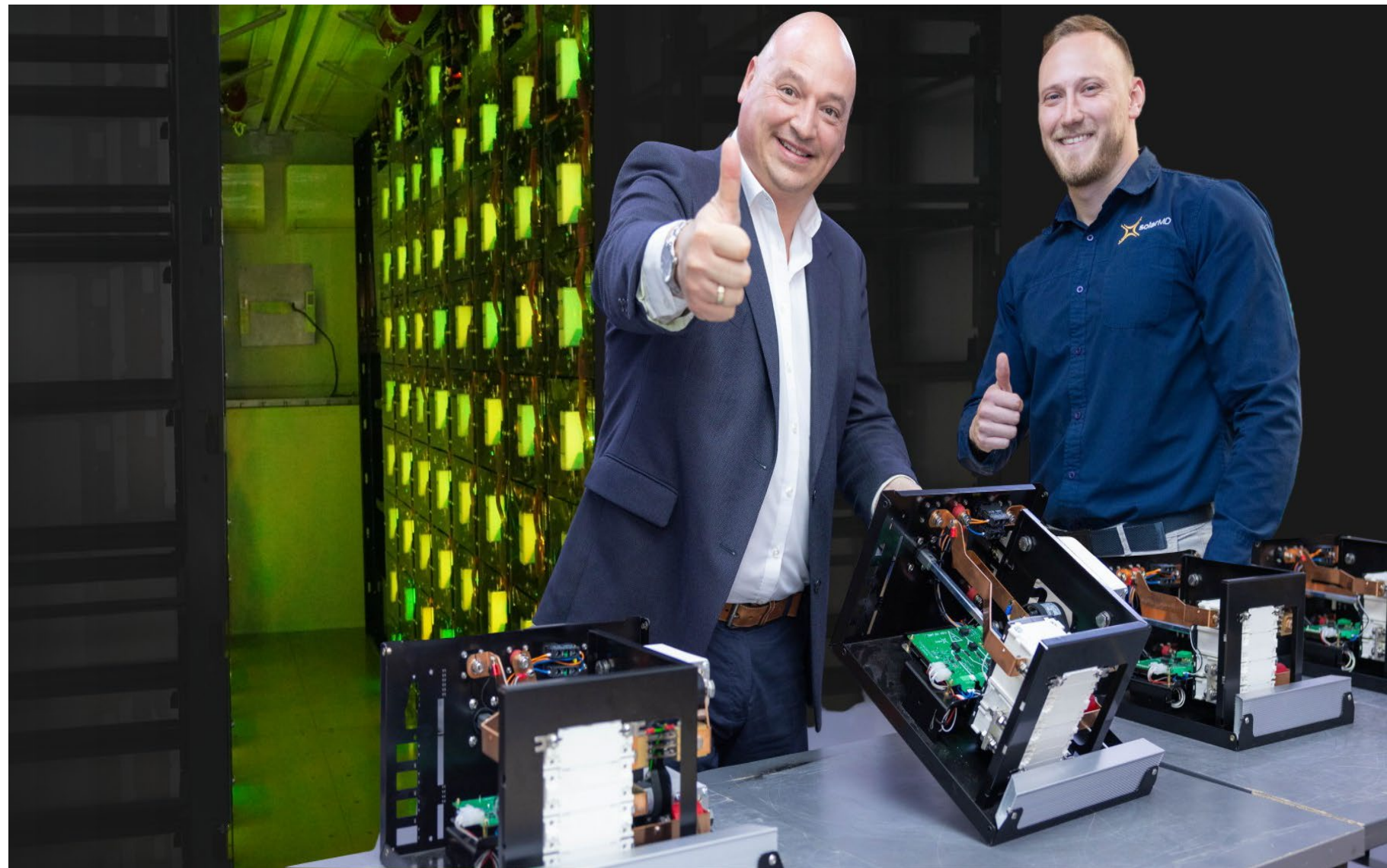
50%+
Employees in R&D

15,00 m2 +
Manufacturing



Energize Your World with Next-Generation Energy Storage Solutions

R&D capability: Electrical design



- Specialize in in-house development and optimization of Electronic Equipment
- Includes BMS hardware, EMS and Logger V2
- Dedicated team ensures full control over design and production process
- Guarantee optimal performance and quality

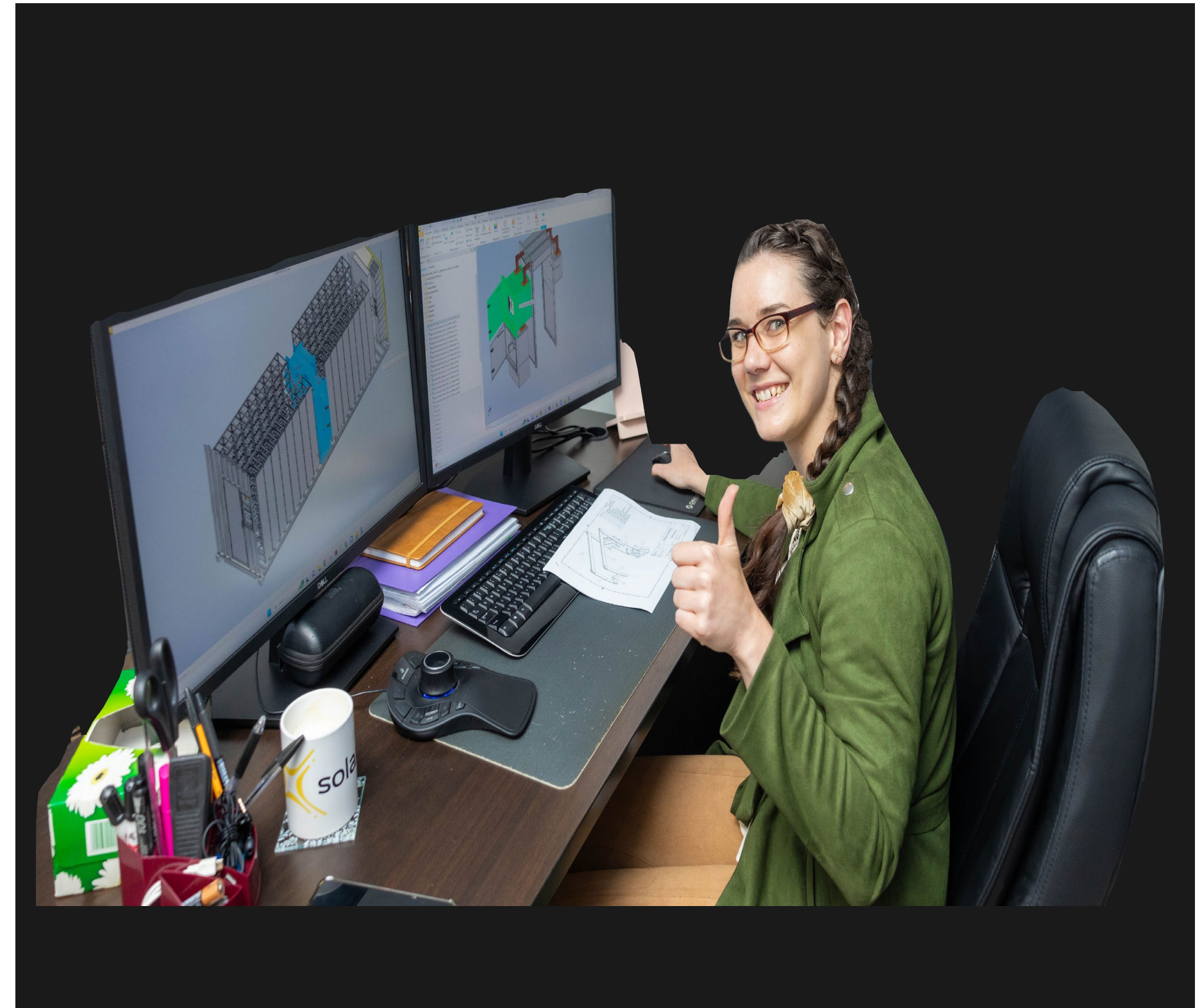
Software design:

- Software engineering department proficient in multiple programming languages
- Responsible for crafting MyPower24 platform, EMS, and BMS software
- Develop in-house production software to streamline operations



Mechanical design:

- Comprehensive mechanical engineering department
From initial design to production
- Skilled mechanical team crafts and designs every product for in-house production
- Expertise ranges from residential batteries to sophisticated commercialized BESS solutions



Production:

Manufacturing Lithium-ion Phosphate Batteries

- Assembling Battery Energy Storage Systems (BESS)
- Fabricating Customized Containerized Solutions

Current Capacity: 1 Gigawatt Annually

- Contributing to Renewable Energy Integration.
- Meeting Market Demand Effectively.

Scaling to 3 Gigawatts Annually

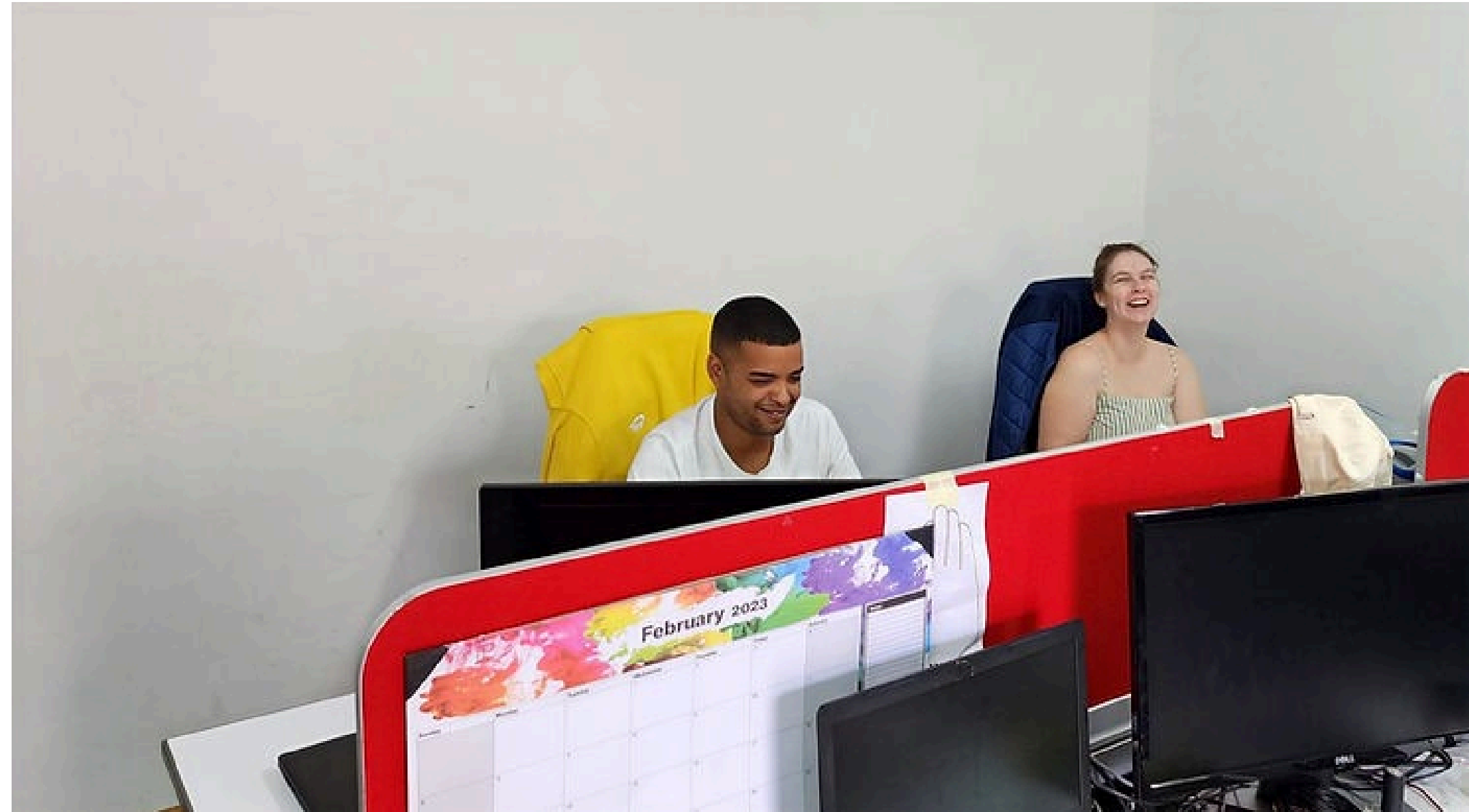
- Addressing Growing Market Needs.
- Accelerating Sustainable Energy Transition.



<https://www.youtube.com/watch?v=0mZm77lhvx4>

Technical Support:

- Strong technical support department
- Troubleshoot any issues related to both low and high voltage batteries
- Assists with firmware updates, BMS replacements and installation
- Available Monday to Saturday via WhatsApp chat and via telephone

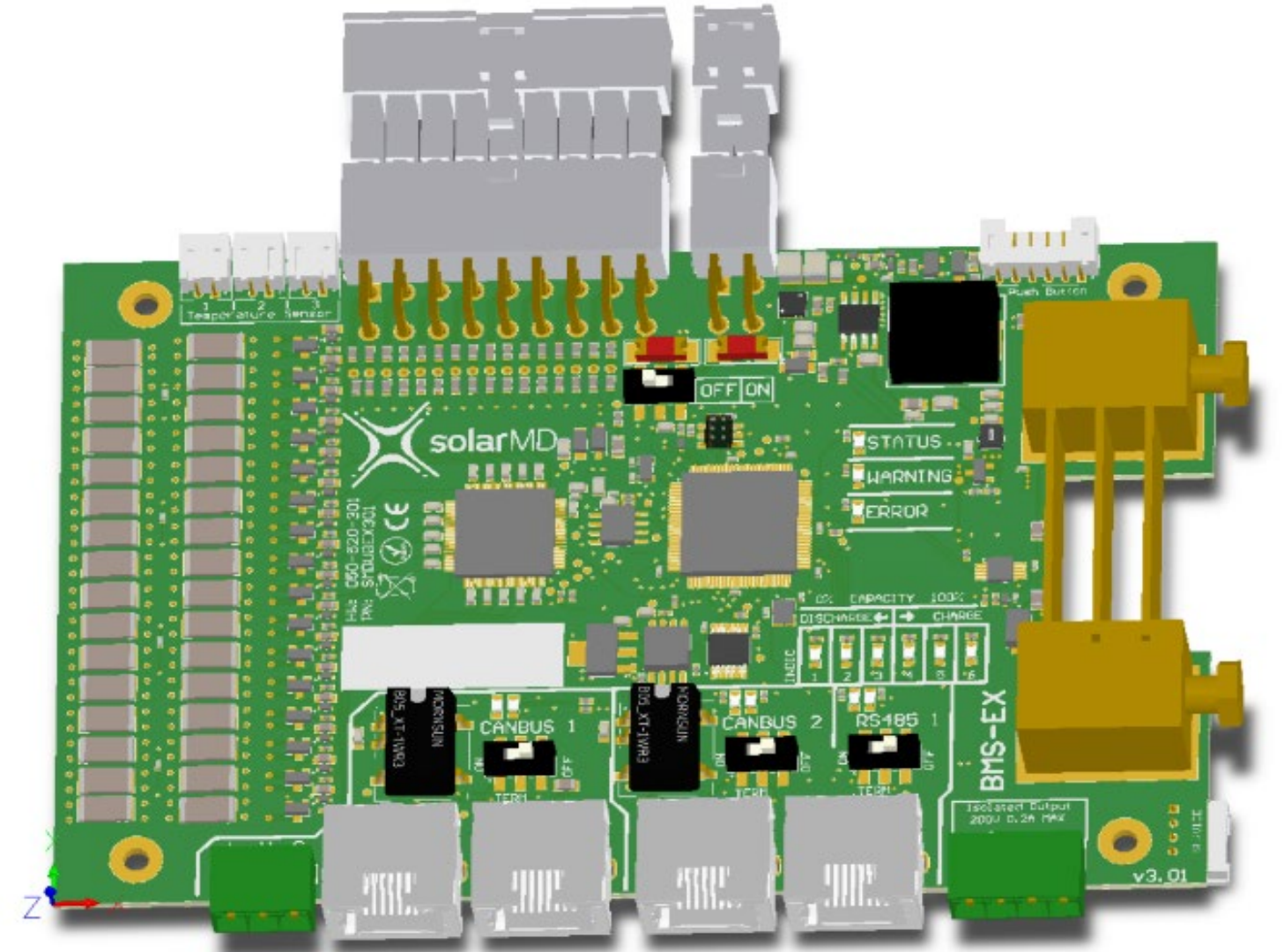


Products: Battery Management System

Each battery module has a **BMS** which is used for communication with LV batteries and the BMU in HV batteries which performs internal functions.

Its functions include:

- Cell voltage measurement
- Cell equalization management
- LV & HV management
- Collection and storage
- Charging and discharging management
- Thermal management
- Measuring the individual cell voltages and module temperature in real time



BMS: Collection and storage function

The BMS-EX is used to collect and record all relevant cell and module data, which is relayed through the Logger V2 for diagnosis and monitoring:

Charge Capacity: accumulated charging capacity.

Discharge Capacity: accumulated discharging capacity.

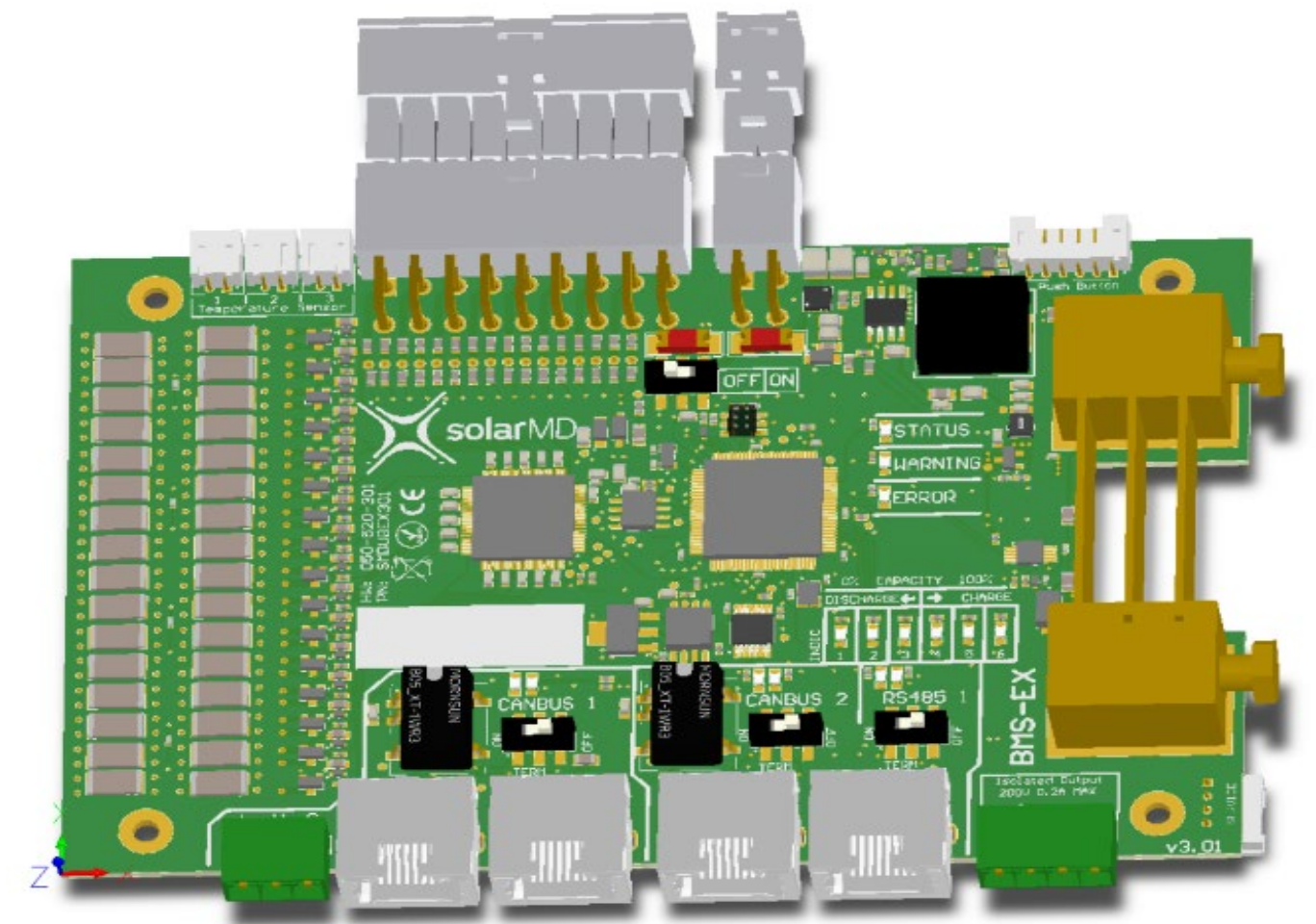
Temp Max: Maximum temperature of cells.

Temp Min: Minimum temperature of cells.

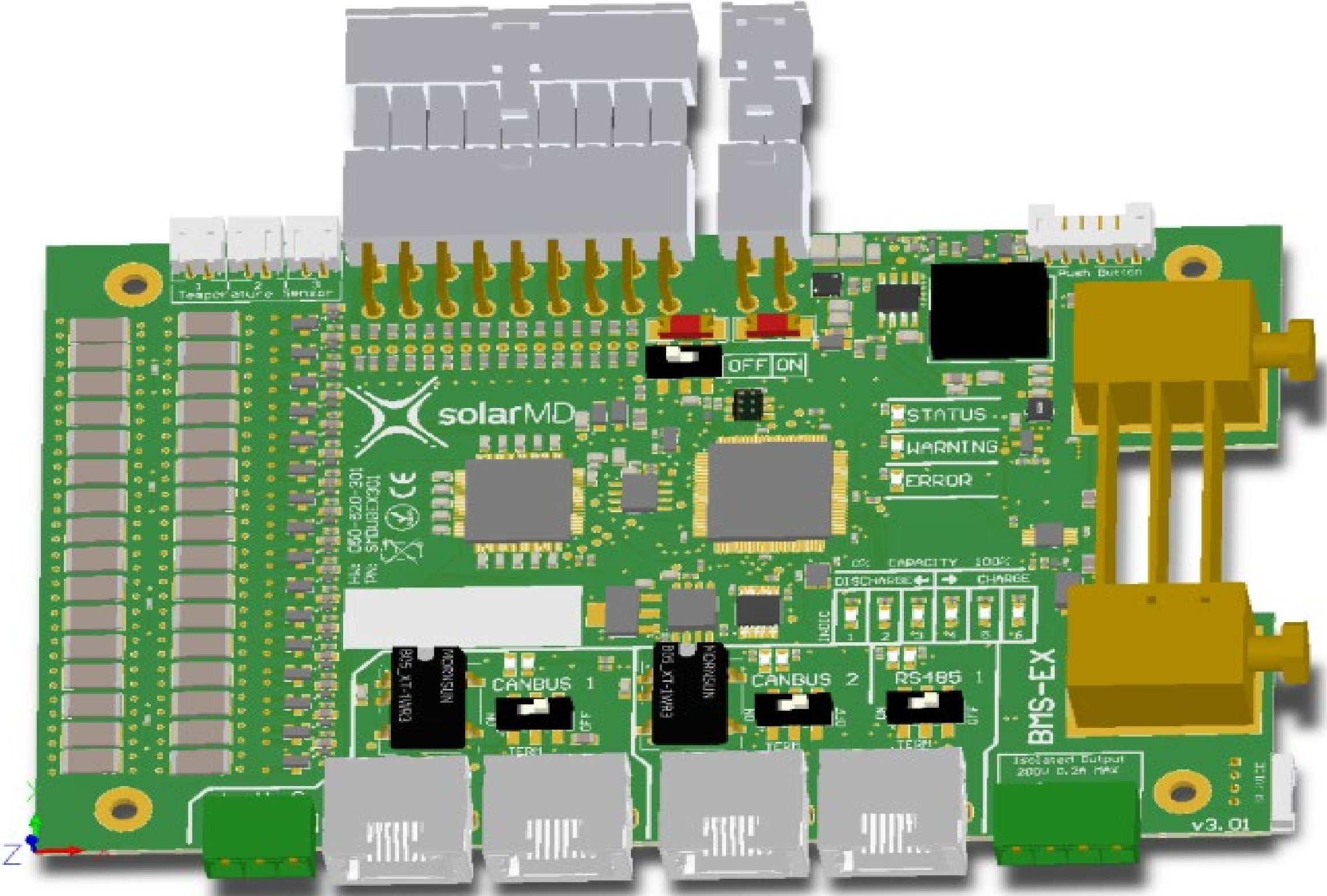
Mod Temp: Temperature of the module.

Vmax: Maximum voltage of cell.

Vmin: Minimum voltage of cell.



Battery Management System

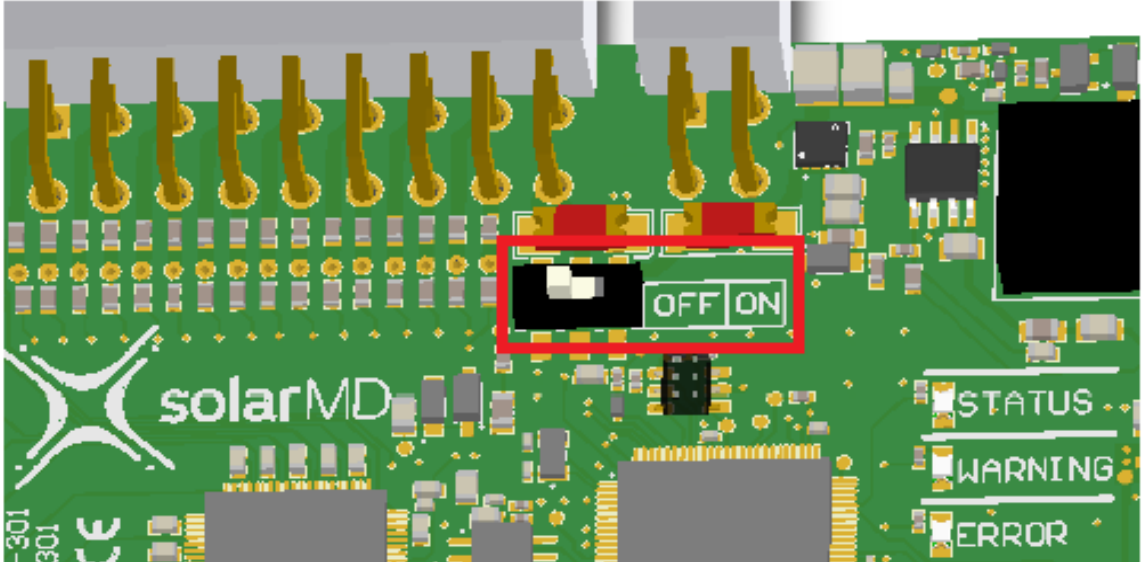


BMS-EX Series

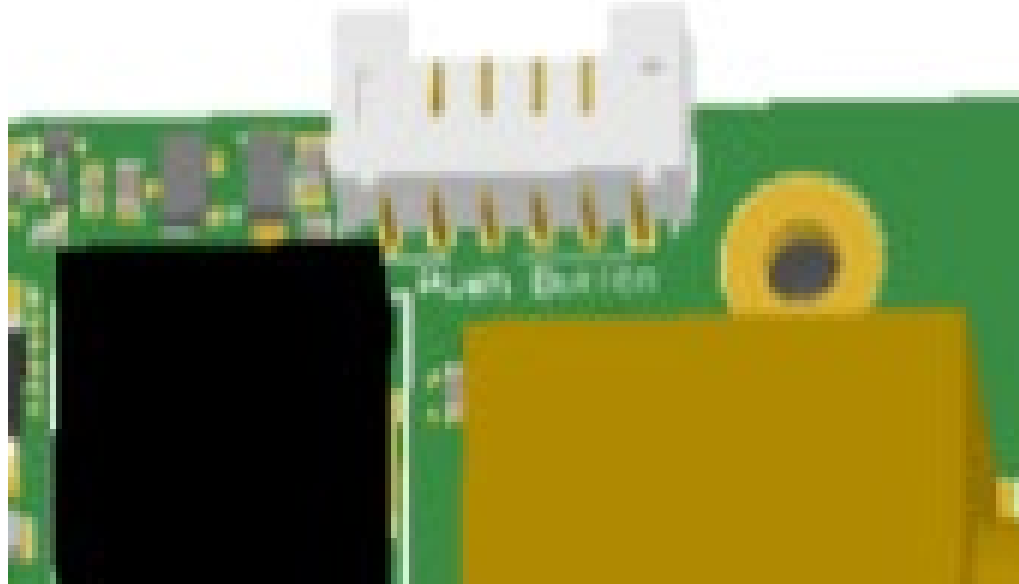


Energize Your World with Next-Generation Energy Storage Solutions

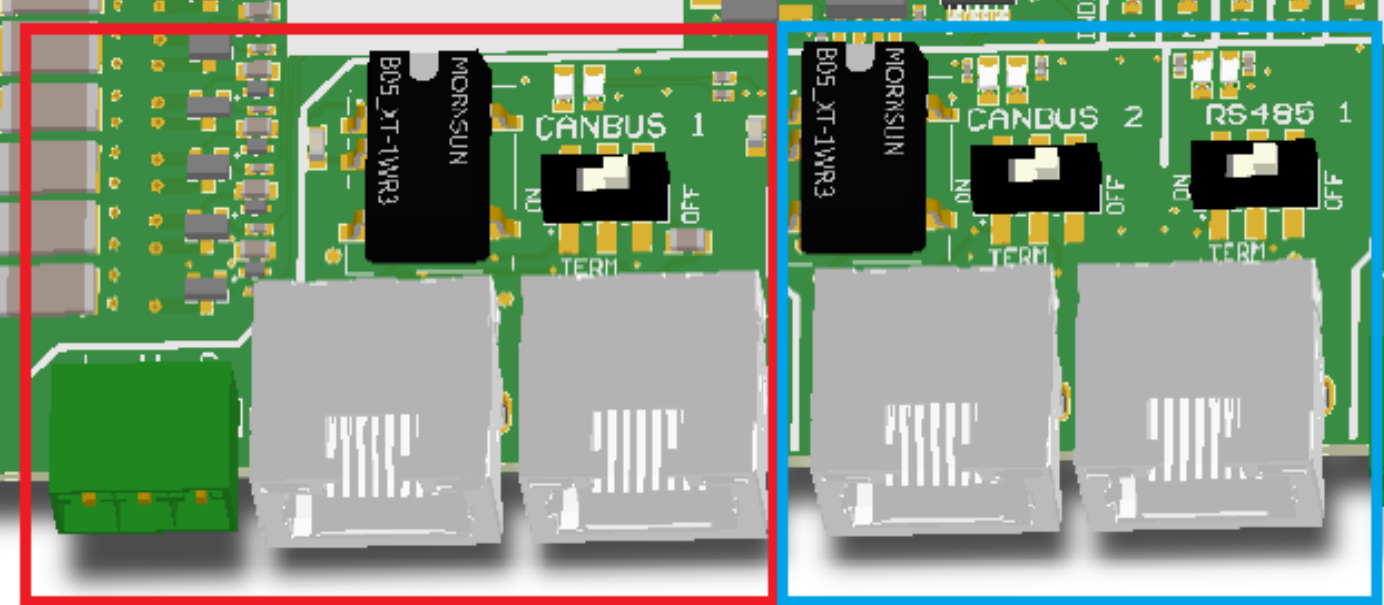
BMS-EX Series features overview



ON/OFF Switch

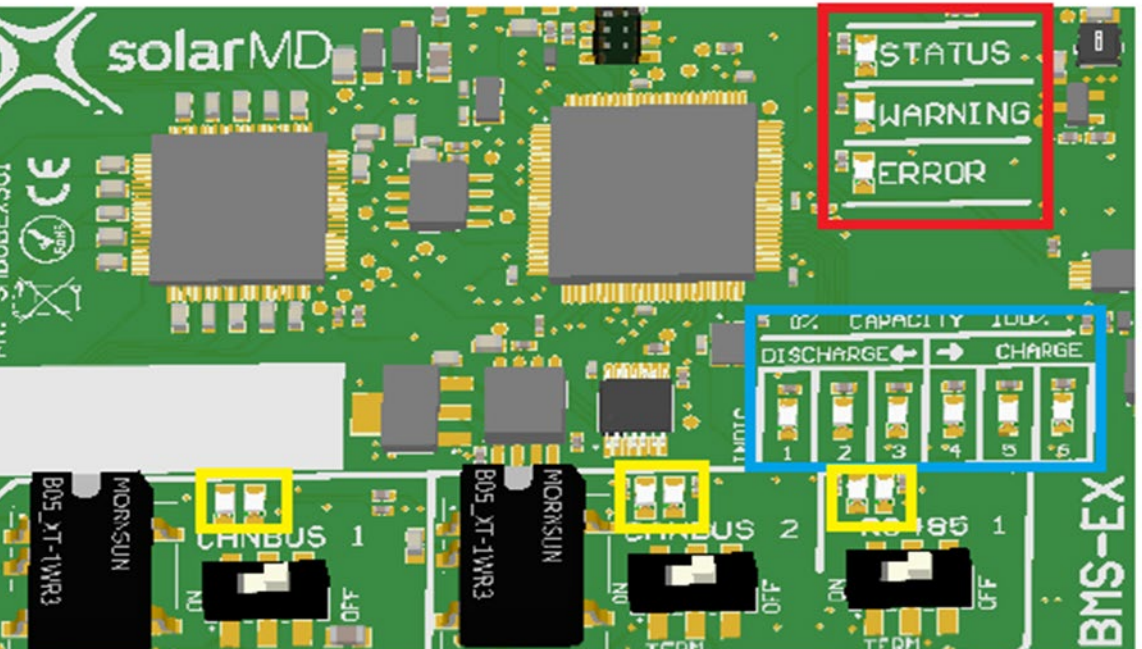


Push Button

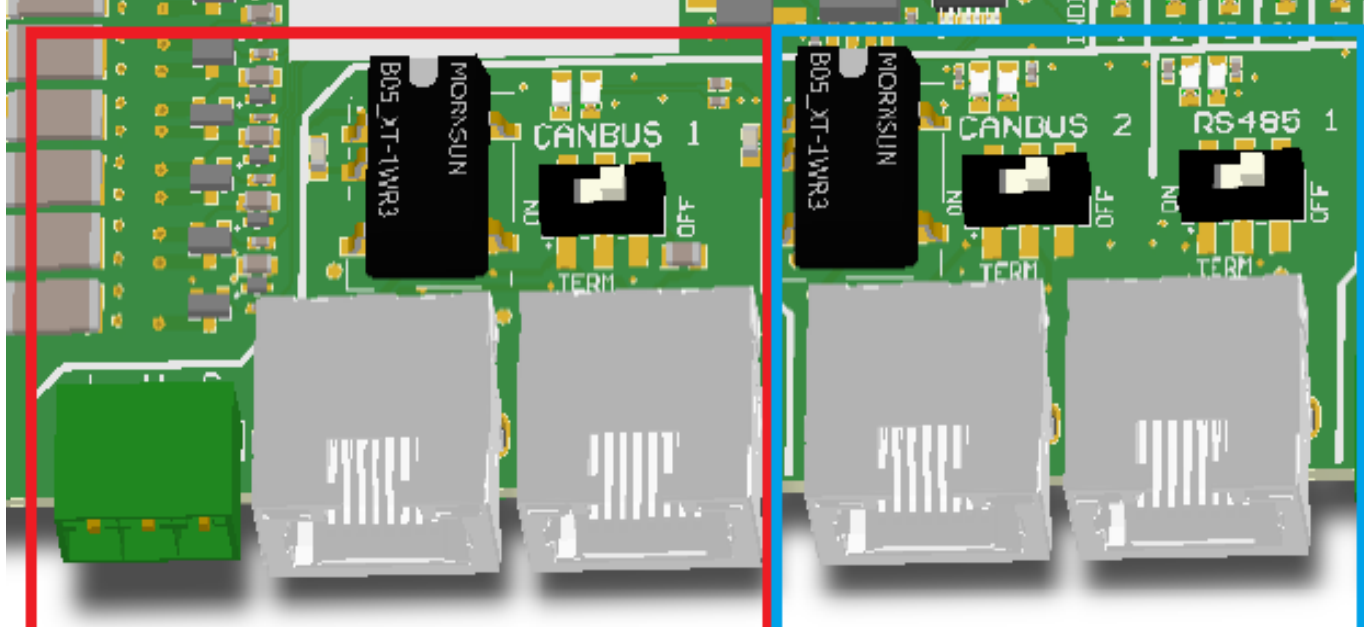


CAN BUS 1

CAN BUS 2 / RS485



BMS status
Indication LEDs
Communication LEDs



CAN BUS 1

CAN BUS 2 / RS485

BMS-EX Series



Energize Your World with Next-Generation Energy Storage Solutions

Low voltage Battery range: SS4083

SS4083 is widely utilized for energy storage in the African market, featuring cutting-edge CALB LiFePO4 technology

SS4083	
Cell chemistry	Lithium Iron Phosphate (LiFePO4)
Cell manufacturer	CALB
Rated capacity	8.3kWh
Nominal Power	7.5kWh
Usable Battery Energy @0.3C	7.51kWh
Nominal Voltage	51.2V
Number of battery modules	1
Weight per module	70kg
Operational Voltage	44.8 - 55.6Vdc
Communication	CANBUS / RS485
Dimensions W x D x H	389mm x 183mm x 635mm
Cycle life @25°C	≥4000
Charging Efficiency	99%
Operational temperature	0°C to +50°C
Transport	UN3480 & UN38.3
Storage duration	6 months @25°C
Safety standard compliance	IEC 62619 / UN38.3 / UL1642
Cell certificate	TUV / CE / UL1642



Low voltage Battery range: SS4143

Lithium-Ion Storage

Energy Sustainability

Say goodbye to power outages and rising electricity costs with SolarMD wall mount battery solutions, putting the power back in your hands



Super-Charging

Charges faster in summer conditions



Water Resistant

Sealed with Leak-In Resistance



Solar Efficient

Be up to 100% independent

Optimise energy usage to complement your power requirements when power demands are high, and charge when power demands are low.



Efficient Battery Capacity

Store all the renewable energy

Extend your self-consumptions and power your home and business entirely with renewable energy. Store all the renewable energy for later use when it's needed.



Cost Reducing

Save on Electricity Costs



Always Powered

No More Load Shedding

Low voltage Battery range: SS4143

SS4143	
Cell chemistry	Lithium Iron Phosphate (LiFePO4)
Cell manufacturer	CATL
Rated capacity	14.3kWh
Nominal Power	10.0kW
Usable Battery Energy @0.3C	13.0kWh
Nominal Voltage	51.2V
Number of battery modules	1
Weight	118kg
Operational Voltage	44.8 - 55.6Vdc
Communication	CANBUS / RS485
Dimensions W x D x H	675mm x 185mm x 605mm
Cycle life @25°C	≥6000
Charging Efficiency	99%
Operational temperature	0°C to +50°C
Transport	UN3480 & UN38.3
Storage duration	6 months @25°C
Safety standard compliance	IEC 62619 / UN38.3 / UL1642
Cell certificate	TUV / CE / RCM / UL1642



High voltage Battery range: SS7011

SS7011



Super-Charging

Charges faster in summer conditions



12 YEARS

Energy Output Warranty



Solar Efficient

Be up to 100% independent

Optimise energy usage to complement your power requirements when power demands are high, and charge when power demands are low.



Efficient Battery Capacity

Store all the renewable energy

Extend your self-consumptions and power your home and business entirely with renewable energy. Store all the renewable energy for later use when it's needed.



Modular

Effortless configuration with an array of batteries



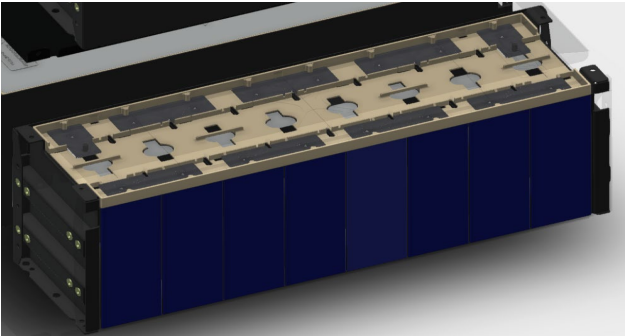
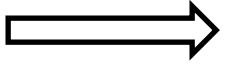
5 YEARS

Guarantee on Product Material and Workmanship

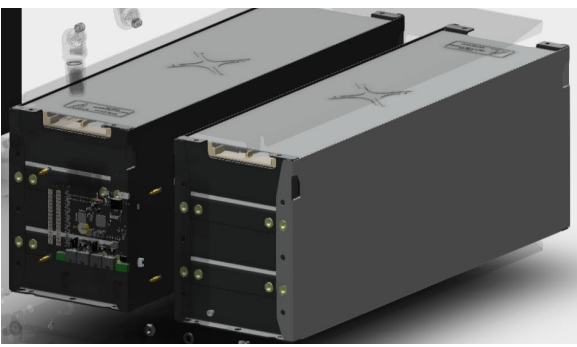
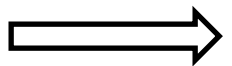
Basic Structure of Energy Storage System



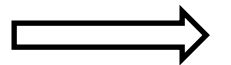
Cells



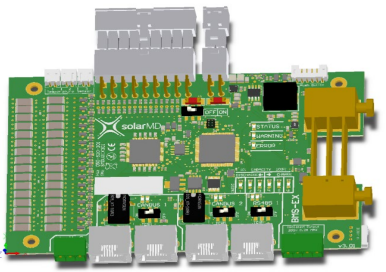
Cell Modules



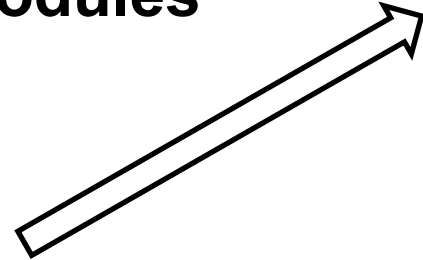
Modules



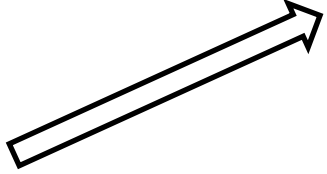
Battery



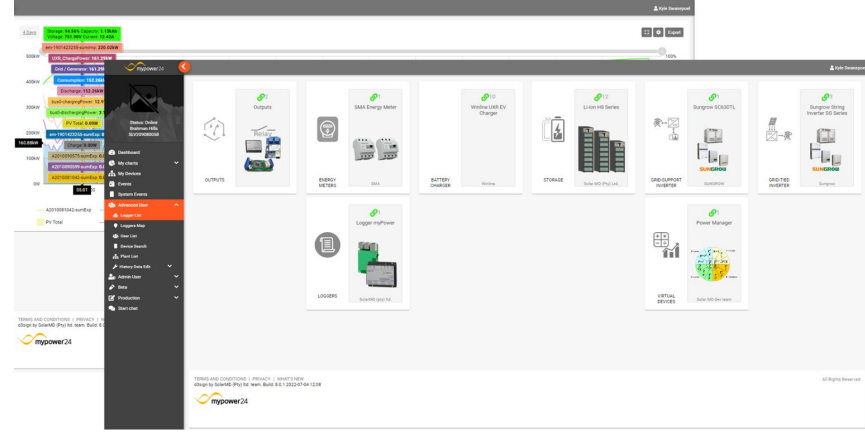
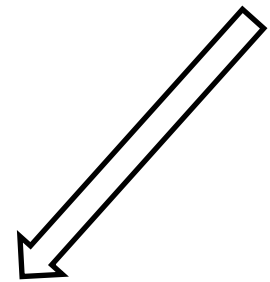
BMS



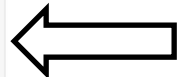
BMU



Battery



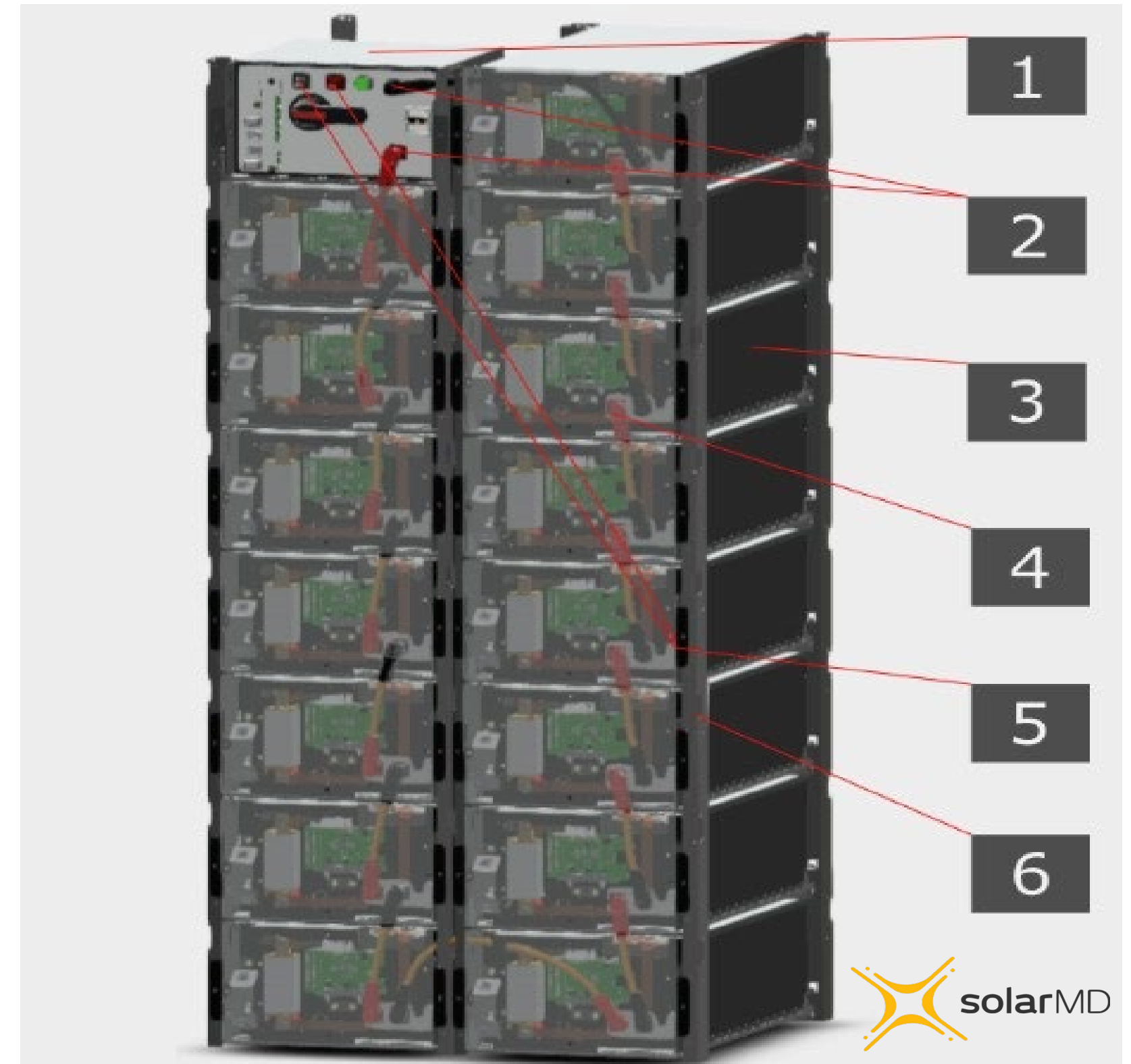
Monitoring



Application

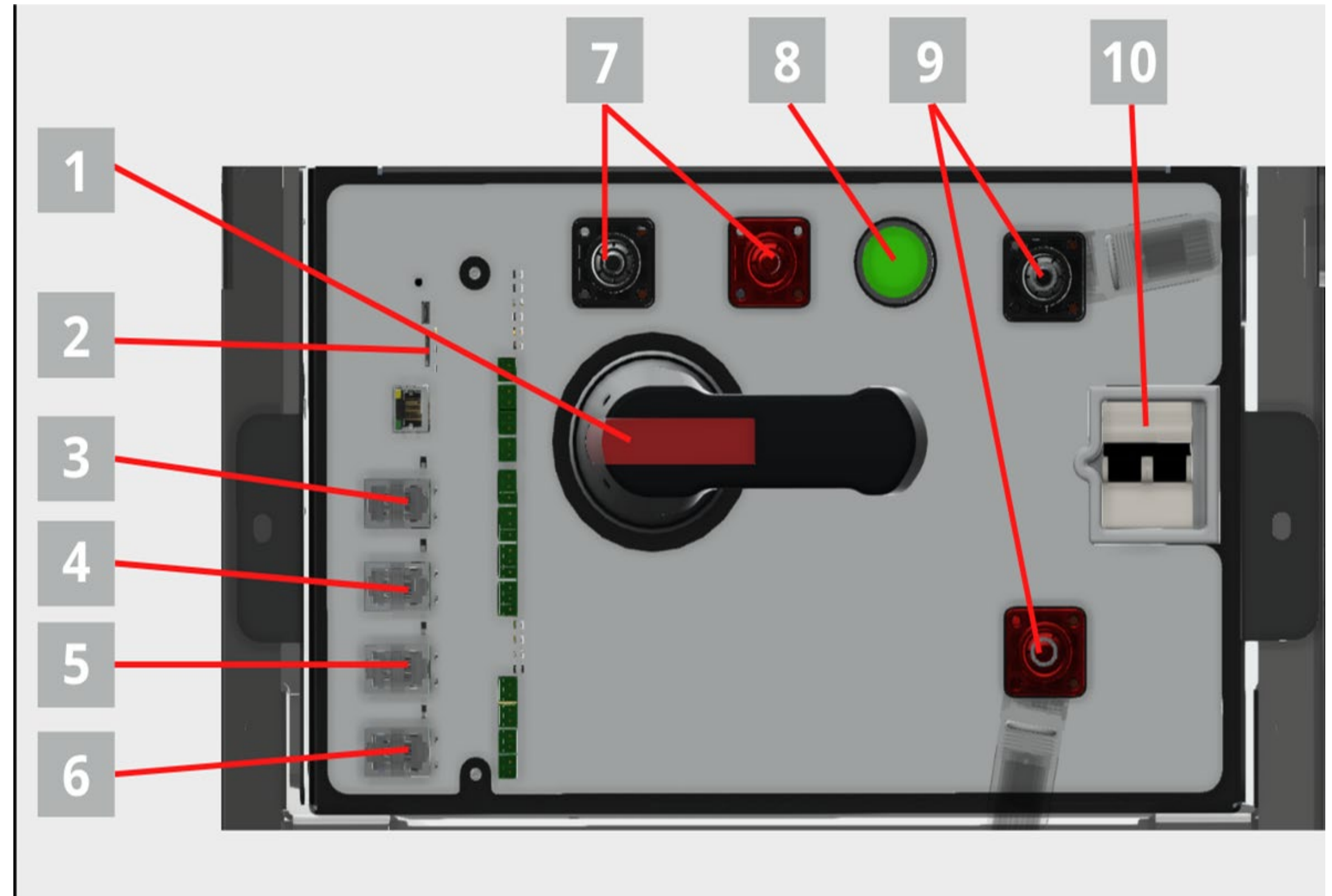
HV Battery - Overview

NUMBER	DESCRIPTION
1	Battery Management Unit (BMU)
2	Battery Positive and Negative Connectors
3	Battery Module
4	HV Battery Module Cables
5	HV Output Cables
6	Battery Frame



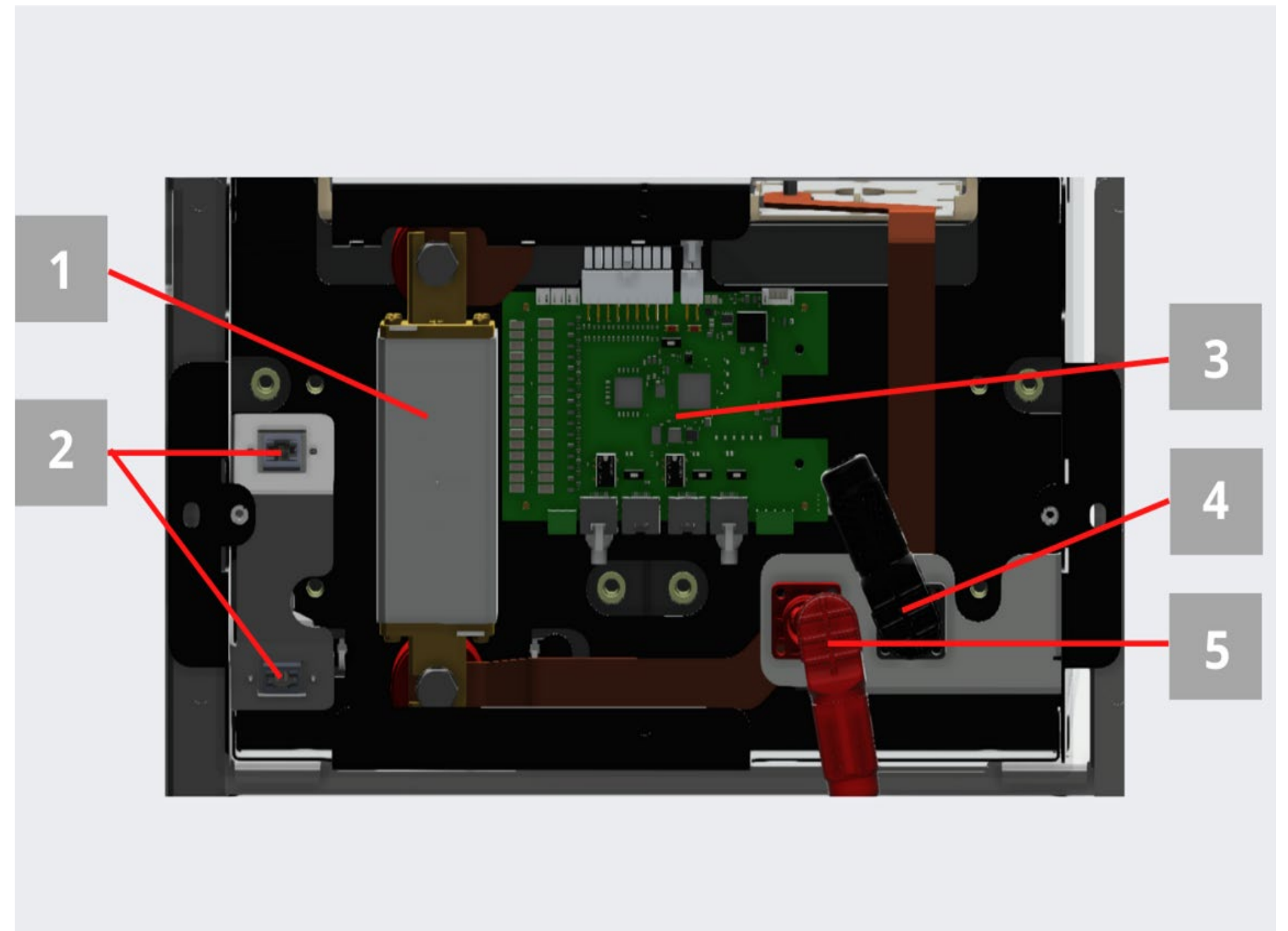
HV Battery - BMU overview

NUMBER	DESCRIPTION
1	Mechanical Isolator
2	Service Ports
3	RS485 (External communication)
4	CAN BUS 3 (External communication)
5	CAN BUS 2 (Internal communication)
6	Can bus 1 (Internal communication)
7	HV Output Connectors
8	Multifunction Push Button
9	Battery HV positive and negative connectors
10	DC Power Supply Fuses

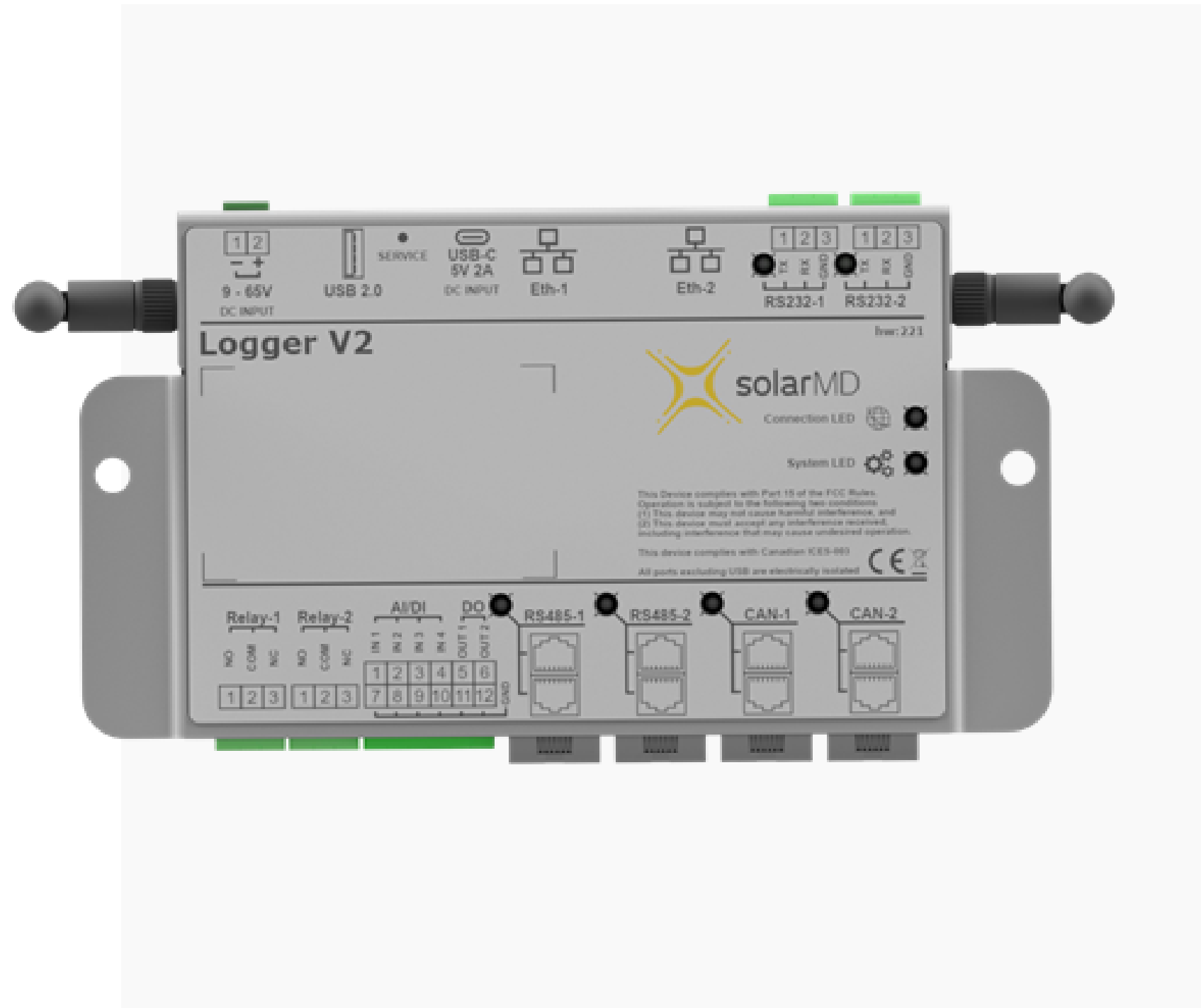


HV Battery - Battery module front view

NUMBER	DESCRIPTION
1	250A Fuse
2	CAN BUS Module Connectors
3	BMS
4	HV Negative Module Connector
5	HV Positive Module Connector



Logger V2



DHCP client & server
Network Provisioning with
dynamic IP addressing



Device Hub
Multiple Device Comptabability

Logger V2 is compatible with over 50
devices, for monitoring and controll.



EMS & FIRMWARE UPDATES
The brain for all your devices

Remote configuration and management
capability, including firmware upgrades over the
air.



Relay Switching

Intergrated Programmable relays
for load control



1 YEAR
Guarantee on Product
Material and Workmanship

My power 24 Demo

The screenshot displays the mypower24 web dashboard. At the top left, the mypower24 logo is visible. The top right corner shows the user name 'Kyle Swanepoel'. The left sidebar contains a navigation menu with the following items: Dashboard, My charts, My Devices (highlighted), Events, System Events, Advanced User, Admin User, Beta, Production, and Start chat. The main content area features five device cards, each with a status indicator (green link icon) and a count:

- Outputs:** 2. Includes a circuit diagram icon and a 'Relay' label. Manufacturer: Solar MD (Pty) Ltd.
- STORAGE:** 4. Includes a battery icon and 'Li-ion H8 Series' label. Manufacturer: Solar MD (Pty) Ltd.
- HIBRYD INVERTERS:** 1. Includes an inverter icon and 'Atess HPS' label. Manufacturer: Atess.
- LOGGERS:** 1. Includes a document icon and 'Logger myPower' label. Manufacturer: SolarMD (pty) Ltd.
- VIRTUAL DEVICES:** 1. Includes a calculator icon and 'Power Manager' label. Manufacturer: Solar MD dev team.

At the bottom of the dashboard, there is a footer with the following text: 'TERMS AND CONDITIONS | PRIVACY | WHAT'S NEW', 'd3sign by SolarMD (Pty) Ltd. team. Build: 8.0.1 2022-07-04 12:08', and 'All Rights Reserved'. The mypower24 logo is also present in the bottom left of the footer area.

1/1

BAT 2

BAT 1

BAT 3

BAT 4

ACTUAL VALUES

BATTERY STATE	RELAY CLOSED - NORMAL
PACK VOLTAGE	477.11 V
CURRENT	9.058 A
POWER	4.32 KW
CAPACITY	32.29 %
	90.42 AH
ENERGY	41.59 KWH
REMAINING CHARGE TIME	--d 21h:01m

PACK INFO

CHARGE CONTROL:	100 %
DISCHARGE CONTROL:	100 %
MODULE COUNT:	9
CELL COUNT:	144
MIN CELL:	3.309mV @ Module:3A Cell:1
MAX CELL:	3.317mV @ Module:1A Cell:8
CELL VOLTAGE DIFFERENCE:	8 mV
UPTIME:	--d 17h:49m
MIN CELL TEMPERATURE:	17 °C
MAX CELL TEMPERATURE:	20 °C

PROTECTION UNIT

ISOLATOR STATE	CLOSED
MAIN RELAY STATE	RELAY CLOSED - NORMAL
BALANCING INFORMATION	
BALANCING STATUS	VB COMPLETE
BALANCING TOTAL CELLS	0
TEMPERATURE	
PRE-CHARGE TEMPERATURE	19
BMU INTERNAL TEMP	18

MODULE 1A

MIN CELL VOLTAGE VALUE:	3.311V @ cell9
MAX CELL VOLTAGE VALUE:	3.316V @ cell8
CELL VOLTAGE DIFFERENCE:	Δ 5 mV
PACK VOLTAGE:	53.023 V
MODULE TEMPERATURE:	20 °C
BALANCING INFORMATION	
BALANCING STATUS	MB COMPLETE
CELLINFO	
	V ΔV Mod ΔV Pack Bal
1	3.314 V +3 mV +5 mV OFF
2	3.314 V +3 mV +5 mV OFF
3	3.314 V +3 mV +5 mV OFF
4	3.314 V +3 mV +5 mV OFF
5	3.314 V +3 mV +5 mV OFF
6	3.314 V +3 mV +5 mV OFF
7	3.314 V +3 mV +5 mV OFF
8	3.316 V +5 mV +7 mV OFF
9	3.311 V +0 mV +2 mV OFF
10	3.314 V +3 mV +5 mV OFF

MODULE 1B

MIN CELL VOLTAGE VALUE:	3.312V @ cell9
MAX CELL VOLTAGE VALUE:	3.317V @ cell8
CELL VOLTAGE DIFFERENCE:	Δ 5 mV
PACK VOLTAGE:	53.032 V
MODULE TEMPERATURE:	19 °C
BALANCING INFORMATION	
BALANCING STATUS	MB COMPLETE
CELLINFO	
	V ΔV Mod ΔV Pack Bal
1	3.315 V +3 mV +6 mV OFF
2	3.315 V +3 mV +6 mV OFF
3	3.315 V +3 mV +6 mV OFF
4	3.315 V +3 mV +6 mV OFF
5	3.315 V +3 mV +6 mV OFF
6	3.315 V +3 mV +6 mV OFF
7	3.315 V +3 mV +6 mV OFF
8	3.317 V +5 mV +8 mV OFF
9	3.312 V +0 mV +3 mV OFF
10	3.315 V +3 mV +6 mV OFF



Battery Energy Storage System (BESS)

- **Design & Scalability**

- Advanced Lithium-Ion storage in a air-conditioned container.
- Fully scalable storage from 1.5MWh+ per container.

- **Hybrid Power Setup**

- Combines diesel and renewable sources for cost savings.
- Improves demand management and adaptability.

- **Modular & Efficient**

- Quick installation in standard containers.
- Utilizes CATL LiFePO4 cells for reliable storage.
- Designed for extreme conditions with easy component replacement.

- **Capacity & Reliability**

- Employs CATL LiFePO4 cells for efficient power flow.
- Pre-commissioned and tested for reliability.



BESS: Engineering Aspects

- **Initial Design:**

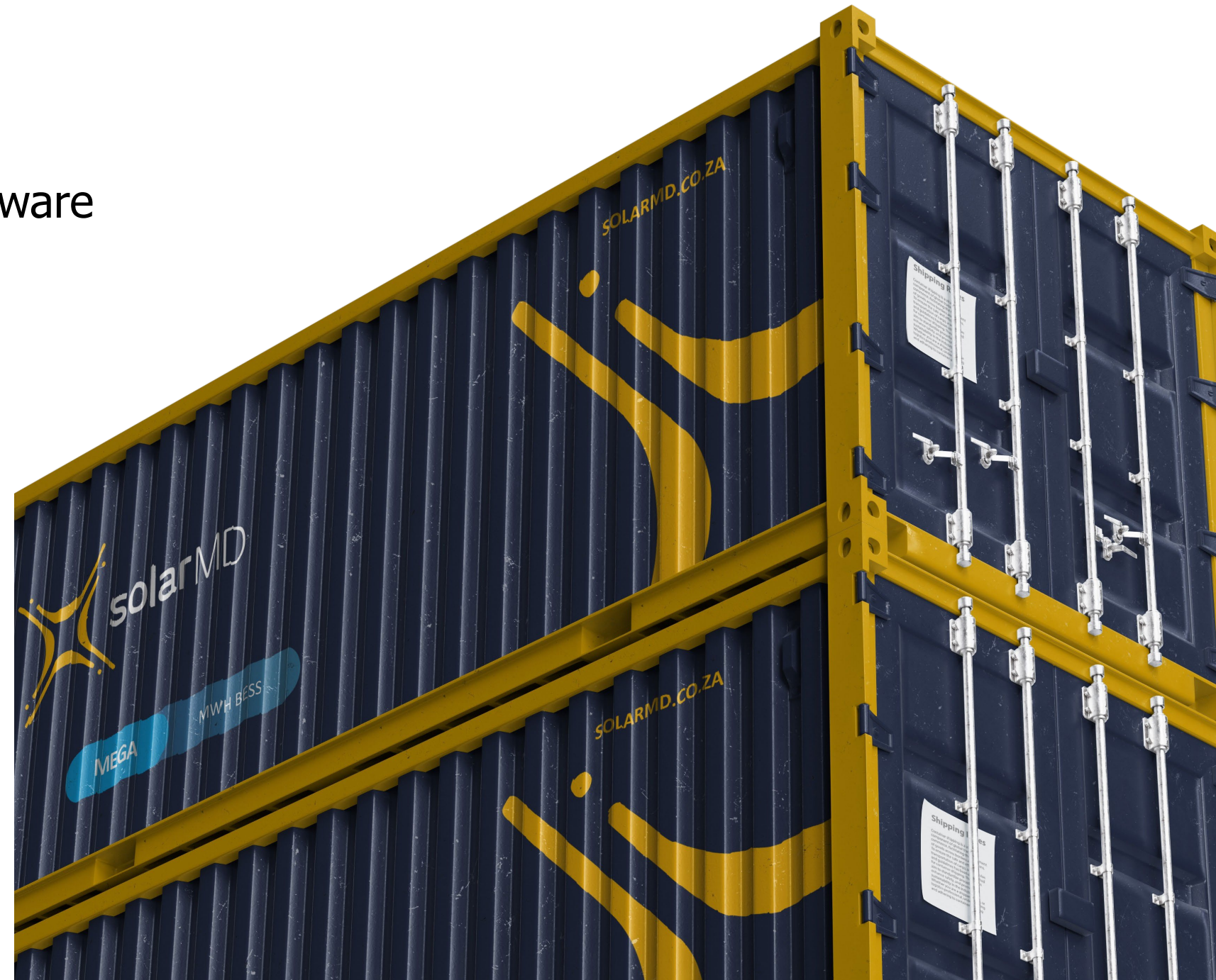
- Drafting of the preliminary layout, understanding of software requirements.

- **Client Presentation of First Design:**

- Introducing design for review and feedback

- **Modification and Manufacturing of Container:**

- Cutting & Welding Container
- Container Painting
- Component Fitting
- Electrical and Mechanical installation
- Software Integration and Testing



<https://www.youtube.com/watch?v=IbkhMGoS6J0>

Solar MD BESS Solution



Thank you