



LEVANDO

User Manual

Model LVM2480 - revision A



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Furthermore, this manual is intended to provide technical, operational, and general information about Levando batteries. However, nothing in this manual should be interpreted or considered as providing additional warranties or as extending the scope of Levando's obligations regarding the performance or services associated with Levando batteries.

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Revision history

Revision	Pages	Description du changement	Date	Par
A	all		2025-09-25	S.P.

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1. INTRODUCTION

1.1. Proper Use of Levando LVM2480 Modules

Levando lithium-ion batteries are high-performance solutions designed to power various electrical equipment, including residential and commercial off-grid systems as well as RV, boat and other auxiliary power systems.

This user guide is intended for qualified users who have received appropriate training on Levando products.

1.2. General Instructions

Pay special attention to sections marked with the following symbols:

Symbol	Description
	<i>Information whose non-compliance may cause serious injury</i>
	<i>Instruction whose non-compliance may cause minor injuries or property damage.</i>
	<i>Information essential for the proper functioning of the product.</i>



Do not open the battery. None of its components are user-serviceable.



Never remove the side screws of the battery. Their removal will void the warranty.



Do not touch the positive (+) and negative (-) terminals of the battery with bare hands and/or metallic objects.



Do not disconnect the battery while under load.



Do not place the battery near flames or other sources of heat.



Levando modules are designed for indoor use only. They are not intended to be exposed to water.



A battery discharged to 0% must be recharged within 2 weeks.

2. GENERAL SPECIFICATIONS

SPECIFICATIONS	LVM2480
Nominal voltage	25.6 VDC
Nominal Energy	8.0 kWh (314 Ah)
Charge / Discharge current	150A continuous
Cycle life	> 8000 cycles (15 to 20 years)
Weight	54 kg
Dimensions	698 x 186 x 252 mm (27.5" x 7.3" x 9.9")
Energy density	148 Wh/kg, 244.5 Wh/L
Operating temperature	0 à 55°C charge -25 à 55°C discharge
Storage temperature	-30 to 55°C (5 to 30°C recommended)
Certification	Cell : UN 38.3, UL 1973, UL 1642, IEC 62619, UL 9540A Module : UL1973 (pending)

2.1. Charge & Discharge Parameters



Do not modify the values in the table below without prior approval from Levando.

Charge & Discharge Parameters - LVM2480

Charge	"Float" voltage	27.0 V
	"Boost" or "Absorb" voltage	27.6 V
	Time in "Boost" or "Absorb"	5 min
	Overcharge protection (BMS disconnection)	29.12 V
	Maximum charge current (recommended)	150 (100) A
	Overcurrent protection – charge (> 0.1 second)	160 A
Discharge	Minimum voltage (recommended)	22.0 (24.0) V
	Discharge protection #1 (based on SOC, configurable)	3 %
	Discharge protection #2 (based on voltage)	18 V
	Discharge protection #3 (BMS shutdown*)	16.8 V
	Maximum discharge current (recommended)	150 (100) A
	Overcurrent protection #1 – discharge (> 10 seconds)	160 A
	Overcurrent protection #2 – discharge (> 0.5 seconds)	640 A
	Overcurrent protection #3 – discharge (> 10 ms)	800 A
	Overcurrent protection #4 – discharge (> 0.1 ms)	1600 A

*Applying a voltage higher than 3V (e.g., a 9V battery or 2 AA cells) to the terminals will wake up the BMS and allow charging.

If you are using a standalone charger with no communication with the battery, consider setting lower voltage limits in charge to maximize the lifespan of your product. Keeping a lithium battery at full charge over long periods of time is detrimental to its cycle life (see next section).

2.2. How to Maximize Product Lifespan

Here are some recommendations to maximize the lifespan of your Levando battery:

- Keep the product at an ambient temperature between 5°C and 30°C (41°F to 86°F);
- Maintain a state of charge between 20% and 80%;
- Limit the charging current to less than 40A when the battery is cold (below 10°C).

3. MODULE INTERFACE

3.1. Overview



3.2. Mounting Screws (Vertical Stacking)

The mounting screws are designed to allow vertical stacking of multiple modules. To stack the modules, first remove the four M5 round-head screws from the top of the lower module. Then, carefully position the upper module and secure it by reinstalling the screws to ensure a solid connection between the modules. There is a locating feature on the handle to facilitate the alignment.

3.3. LED Indicator

The battery is equipped with a front-facing indicator light. The color codes are described below.

Couleur	Description
	The battery is operating, and its state of charge is indicated by a color gradient from red to green, where red represents 0% and green represents 100%.
	The battery's DC output is disconnected.
	The battery has a permanent fault.

3.4. Touch Button

The touch button allows interaction with the module. To activate one of the three options, press and hold the button. The LED will turn off for 3 seconds and then sequentially display the color associated with each option. To select an option, release the button when the LED shows the color corresponding to the desired option and then press again immediately while the LED is flashing to confirm the selection.

function	Description	LED color
Enable / Disable	The module will enable or disable the DC output.	
Reboot	The BMS is restarting; some errors will be reset.	
Factory calibration	The module will restore the factory settings.	

3.5. Communication Connectors

Levando battery modules are equipped with industrial-grade M12 IP67 connectors, designed to ensure a robust connection to inverters and inter-module communication. Their standardization also facilitates integration of Levando modules into various systems while ensuring quick and secure connectivity during installation and maintenance. An 8-pin M12 A-coded cable is required for connecting Levando modules in series. To connect two modules in series, a communication cable must be installed between them, along with a termination connector to ensure stable and reliable communication. See the image below.



An incorrect connection to the pins of the M12 communication cables may damage the BMS.

Below is the orientation and pin numbering of the M12 communication connectors.



Here are the details of each pin function.

Pin	Fonction
1	CAN+
2	CAN-
3	AUX SIGNAL
4	3V3
5	RS485 B
6	RS485 A
7	GND
8	ALARM

The 3V3 supply can only source 200 mA per module, connecting a load that requires more current than this will cause issues.

3.6. Power Connections



Users must wear appropriate personal protective equipment (PPE), including gloves and safety glasses, when connecting Levando modules.

Levando battery module terminals are UL rated and do not require crimping of lug terminals on your cables. They accept busbars or power cables ranging from 2/0 to 8 AWG, whether stranded or solid.

Cables can be doubled for parallel connections or you can use Levando's busbars for a simpler and cleaner installation. Using ferrules appropriate for the cable gauge is recommended for flexible cables but not mandatory. Proper torque application is mandatory using an appropriate torque wrench. Loose power connexions may cause overheating that will result in See images below.



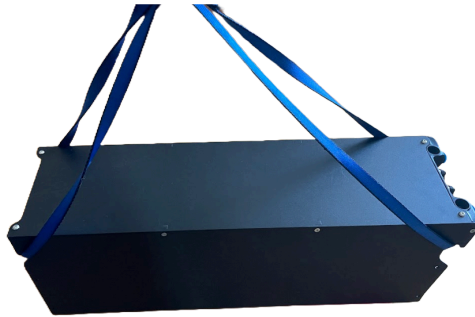
4. COMMISSIONING

4.1. Handling



Users must wear appropriate PPE when transporting Levando modules.

Modules should be carried by two people. Slots are provided for inserting straps to ensure safe transport. Users must wear appropriate PPE. For small movements, the front and back handles may be used.



4.2. Module Safety Device

Each Levando battery module is equipped with an integrated current cut-off device, designed to ensure system safety and protect connected equipment from overvoltage or overcurrent conditions. By default, your Levando battery is energized and ready to use without any user input upon delivery. It is recommended to deactivate the battery during the installation to prevent short circuit or other electrical hazards. During installation, it is essential to comply with local electrical codes to guarantee safe and optimal operation. This includes proper wiring, short-circuit protection and grounding. A compliant installation optimizes system performance and prevents potential hazards to users and surrounding electrical infrastructure. Paint-piercing washers and/or metal screws can be used to bond the aluminum casing to the grounding wire.

4.3. System Pre-Charge

Levando battery modules include a pre-charge resistor that is automatically activated when the module is energized (the module must be de-energized prior to activation for the pre-charge circuit to be activated, simply connecting an already active module will cause high inrush currents). Once the pre-charge phase is complete, the main connection is established and the battery operates normally. This process ensures a smooth start-up and protects both the battery and connected equipment from sudden inrush currents.

5. FAULT MANAGEMENT

5.1. Introduction to the BMS

The Levando BMS (Battery Management System) used in each battery module is designed to protect the battery and its cells from conditions that could damage or shorten the system's lifespan. This protection ensures optimal operation and prolongs battery life. Each Levando LVM2480 module is specifically configured for maximum performance and compatibility with a wide range of off-grid inverters and equipment.

All faults are displayed in the Levando mobile app for easy diagnosis with detailed tooltips.

5.2. BMS Protections

PCB Thermal Protection

The BMS monitors the temperature of the printed circuit board (PCB) containing the main battery management components. In case of overheating, the battery is automatically disabled to prevent damage.

Cell Balancing

Cell balancing maintains each cell within a specific voltage range to optimize battery lifespan and performance. This function is fully automated and ensures reliable module operation.

Extreme Temperature Protection

Operating the battery in extreme cold or heat can cause permanent damage. The BMS monitors temperature in real time during charge and discharge cycles and puts the battery in a safe state if critical thresholds are reached. Extreme temperatures (less than -35°C and higher than 65°C) will permanently disable the battery due to cell damage.

Overvoltage and Undervoltage Protection

The BMS continuously monitors each cell's voltage to prevent overcharge or excessive discharge, protecting performance and module longevity.

Overcurrent Protection

The BMS controls charge and discharge currents and integrates multiple safety mechanisms against overcurrent events. It reacts quickly to short circuits and excessive currents using built-in components that cut off power when limits are exceeded.

5.3. Reactivation After a Fault

If the battery is used outside its operating limits, the BMS will disable the output. In case of misuse, the indicator LED will light up blue to signify that the battery is in a de-energized state (i.e. discharge disabled).

Before attempting a restart after the BMS disconnects, check the following:

- Ensure no short circuits are present on the DC circuit. In case of a short circuit, disconnect all loads from the DC bus to allow module reactivation (may take a few minutes).
- Module temperature is above -20°C .
- If the battery is fully discharged (LED is OFF and no voltage at the terminals), connect it to a charger in a temperate environment (15°C to 30°C). The LED should activate in less than 30s. If the battery was below 0°C , it may take a few hours for the cells to raise their temperature.

Once these checks are complete, attempt a restart using the touch button.

If the indicator remains blue, repeat the activation/deactivation cycle.

As a last resort, perform a factory calibration.

If the touch button is not responsive, you may also perform these steps using the Levando mobile app.

If the module still does not restart, contact Levando support at info@levando.com.

5.4. Permanent Module Damage

If the module suffers irreversible damage, the indicator will light purple. In this case, contact Levando service immediately, physically disconnect the battery from your installation and stop using the battery.

6. STORAGE

If you do not plan to install your Levando battery immediately after purchase, or if you intend to store it for an extended period, it is essential to follow these recommendations to preserve its performance and longevity. Proper storage prevents premature degradation and ensures optimal recommissioning.

Battery State Before Storage

The state of charge (SOC) at the time of storage directly affects conservation and aging. We recommend charging each battery to between 30% and 50% SOC before storing it.

LFP batteries naturally lose a small fraction of their charge during storage. This loss depends on both duration and storage conditions. We recommend recharging the battery after 8 to 9 months, or if its SOC drops below 10% during long-term storage. Maintaining a very low SOC (<5%) for extended periods reduces product lifespan.

Optimal Storage Conditions

The storage environment plays a key role in battery preservation. To avoid loss of performance:

- Maintain an ambient temperature between 5°C and 30°C (41°F to 86°F).
- Store the battery in a dry location, away from standing water and direct exposure to rain.
- Avoid direct sunlight to prevent overheating.
- Mount the battery on a non-combustible surface and keep it away from flammable materials.

By following these recommendations, you ensure safe and optimal conservation of your Levando battery until commissioning.

7. WARRANTY STATEMENT

During the first year following the purchase of your Levando battery, if it is eligible for this limited warranty, 100% of the replacement cost will be covered. Starting from the second year, coverage will be adjusted according to the following table:

Years of use	% covered
2 ans	70%
3 ans	60%
4 ans	50%
5 ans	40%
6 ans	30%
7 ans	25%
8 ans	20%
9 ans	15%
10 ans	10%

The replacement is conditional upon the return of the defective battery to Levando with proof of purchase. The return applies to the purchase of a replacement Levando battery module. The percentage is calculated based on the original purchase price.

This limited warranty does not cover a product that has prematurely reached the end of its normal service life due to excessive use (multiple charge/discharge cycles per day and/or systematically charging and discharging at the operating limits) and/or prolonged exposure to high temperature ($>35^{\circ}\text{C}$). The total amount of energy that the battery can store and discharge over its useful life is specific and will be affected by usage and storage conditions. Levando reserves the right to refuse to honor the warranty if it is determined that the product has reached its normal end of life, even if it remains within the warranty period.

This limited warranty does not apply to components that are non-essential to the battery's operation, such as the indicator light, the button, as well as Bluetooth and Wi-Fi features. These features are covered for 1 year against manufacturing defects only.

Non-Transferable Warranty

This limited warranty applies exclusively to the original purchaser of the product and is not transferable to any other person or entity. For any warranty claims, please contact the place of purchase.

Warranty Exclusions and Limitations of Liability – Levando Batteries

Under this limited warranty, Levando has no obligation for any product subject to the following conditions, including but not limited to:

- Damage occurring during installation or removal of the battery.

- Damage caused by mishandling of the product.
- Exposure to inappropriate environmental conditions.
- Damage resulting from improper maintenance.
- Unauthorized modification, alteration or disassembly of the product.
- Use of the product for purposes other than those intended by the manufacturer.
- Damage caused by lightning, fire, flood, or any other force majeure event.
- Product with a serial number that has been altered, erased or removed.

Installation and Liability

Levando batteries are designed to be installed only by qualified professionals certified in electrical and solar installations. We strongly recommend that customers hire a qualified specialist to install Levando batteries.

Levando does not warrant:

- The safety of the purchaser during installation.
- The success of equipment implementation.
- Compliance of the installation with local codes and regulations.

Levando disclaims all responsibility for any other warranties, express or implied, including but not limited to any implied warranty regarding the accuracy or completeness of the information provided, or the suitability of the product for a specific use. No warranty may be created or extended through promotional or commercial documentation.

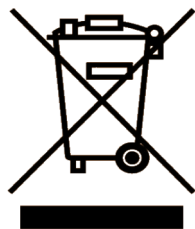
Any advice provided by Levando before, during, or after the purchase of a battery is intended solely for general informational purposes and does not replace the expertise of a qualified installer. The purchaser agrees to fully indemnify Levando against any legal action related to direct or indirect losses resulting from the installation of the product, with liability limited to the purchase value of the equipment.

8. END OF LIFE AND RECYCLING

Levando batteries are designed to provide a lifespan of more than 20 years when used properly. They have been developed to ensure optimal performance after thousands of charge and discharge cycles. However, when a battery reaches the end of its life, it is important to recycle it responsibly.

Lithium iron phosphate (LFP) batteries are considered hazardous materials and must never be disposed of with household waste. Many recycling centers and organizations accept LFP batteries, often free of charge or at a low cost to the user. We recommend searching online for "lithium battery recycling near me" to identify available collection points in your area. Before visiting, we advise calling to confirm that the center is open and accepts this type of battery.

If you cannot find a suitable recycling solution, Levando can assist you. Before discarding or improperly disposing of a battery, please contact us for guidance and support on how to safely recycle your battery.



Li-ion

NOTES

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