800-372-9253 www.mkbattery.com

Deka duration®

INSTALLATION GUIDE AND USER MANUAL

DD100-12 | DD300-12 | DD460-12

DD100-12H | DD300-12H | DD460-12H

Release Date: Mar. 9, 2026

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1.Safety

1.1 Statement

Please read the manual carefully before installing, operating, or maintaining the equipment. Pay close attention to all warning labels and safety instructions. Improper handling may result in overheating, fire, rupture, damage, or reduced capacity. MK Battery shall not be responsible for accidents caused by failure to follow the operating instructions.

1.2 Manual Symbols

The following symbols used indicate important information that should be carefully observed during operation.

Symbol	Statement
	Attention: Serves as a reminder of important safety precautions that must be followed during operation.
	Danger: Warns of potential electric shock during operation. Appropriate protective measures must be taken.

1.3 Critical safety information

For installation, operation, and maintenance of the battery, the following instructions must be followed.

Pre-installation

Read this manual thoroughly before installing or operating the battery. Failure to follow the instructions and the warnings in this manual may result in electric shock, serious injury, or damage to the battery and associated equipment.

During installation:

This product must be installed by professionals who are familiar with the electrical standards and regulations of their country or region. For optimal safety, follow the installation procedures outlined in this manual.

Battery operation:

- Do not connect batteries of different types.
- Only use compatible chargers that are in good working condition.
- Ensure that the environmental conditions comply with those specified in the product specifications.
- If the battery is damaged, excessively hot, or emitting a strange odor, immediately disconnect the power and discontinue use.

1.4 Specifications

Performance

Voltage	12V
Efficiency	99%
Self-Discharge Maximum	3% per month
Cycles	6K at 80% DoD
Built-in BMS	Internal
Resistance	< 30 mΩ
Usable DoD	100%

Temperature

Operational Temperature	-4° to 140°F (-20° to 60°C)
Discharge Temperature	-4° to 140°F (-20° to 60°C)
Non Heated Model Charge Temperature	32° to 140°F (0° to 60°C)
Heated Model Charge Temperature	-4° to 140°F (-20° to 60°C)
Storage Temperature	59° to 95°F (15° to 35°C)
BMS High Temperature Cut-Off	149°F (65°C)
BMS Reconnect (Charge)	113°F (45°C)
BMS Reconnect (Discharge)	122°F (50°C)

Mechanical

Terminal Type	Threaded Insert
Terminal Hole	M8 Bolt
Terminal Torque	8-12Nm
Case Material	ABS+PC Fire Rated
Cell Type - Electrolyte	LiFePO4
IP Rating	IP67

Certifications

Certifications	UN38.3, UL 1973 Recognized Component, IEC62619, CE
Cell	UN38.3, UL9540A, UL1642
Shipping Class	UN38.3, UN3480, Class 9

DD100-12

Capacity	100Ah
Recommended Charge Current	50A
Max Charge	100A
Recommended Discharge Current	50A
Max Discharge	150A
Surge Current Limit	500A for 3S
Short Circuit Protection	1000A / 500us
Dimensions - L x W x H	12.1" x 6.6" x 8.3"
Weight	26 LB

DD300-12

Capacity	300Ah
Recommended Charge Current	150A
Max Charge (Using the Busbars)	300A
Recommended Discharge Current	150A
Max Discharge (Using the Busbars)	300A
Surge Current Limit	1000A for 5S
Short Circuit Protection	1200A / 500us
Dimensions - L x W x H	19.7" x 10.4" x 9.2"
Weight	81.8 LB

DD460-12

Capacity	460Ah
Recommended Charge Current	150A
Max Charge (Using the Busbars)	300A
Recommended Discharge Current	150A
Max Discharge (Using the Busbars)	300A
Surge Current Limit	1200A for 5S
Short Circuit Protection	1200A / 500us
Dimensions - L x W x H	19.7" x 10.4" x 9.2"
Weight	98.1 LB

The over discharge current protection will be triggered if the max surge exceeds the specified time, and it will recover automatically after 60 seconds. However, if this protection is triggered 10 times, it will only recover through charging or restarting (press power ON/OFF) the battery

1.5 Charging Parameters

To ensure safe operation and maximum service life, it is recommended to use a charger or controller with **lithium-ion charge settings.**

Charging

Absorption Voltage	14.2V - 14.6V
Float Voltage	13.6V - 13.8V
Absorption Time BMS Cell	60 minutes per 100AH
Balancing Voltage Range	13.4V - 14.6V

Discharging

Recommended LVD BMS	11 - 11.6V
Discharge Voltage Cut-Off	10.6 - 11V
Reconnect Voltage Short	11.8 - 12.2V

System	Recommended Charge Voltage	Recommended Float voltage
48V	56.8V	55.2V
36V	42.6V	41.4V
24V	28.4V	27.6V
12V	14.2V	13.8V

Notice: If the battery includes a heating function, charging will not begin until the heater raises the cell temperature to a safe level.

Caution: Over-voltage charging or failure to disconnect the charger after full charge can cause overheating, reduced performance, or permanent damage to the equipment.

1.6 Heating Function (for heating modules)

If the battery model is equipped with a low-temperature heating feature, when a charger is connected, the built-in heater automatically activates when the temperature drops below **0 °C (32 °F).**

- The battery is warmed to **10 °C (50 °F)** before charging begins.
    - If the battery temperature is between **-10 - 0°C,** it may be charged only if the current is at or below 0.05C.
- Once the safe temperature is reached, normal charging mode resumes.

1.7 Passive Balance Function

As the battery approaches 100% State of Charge (SOC), small differences between cells can lead to voltage imbalance. The Battery Management System (BMS) automatically corrects this by:

- Slightly discharging higher-voltage cells until all cells are equalized.
- Ensuring consistent cell performance across the pack.
- Improving long-term reliability, safety, and service life.

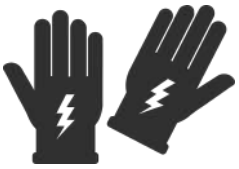
Voltage VS Capacity

Voltage Level	Remaining Capacity
14.4V	100%
13.6V	100%
13.4V	99%
13.3V	90%
13.2V	70%
13.1V	40%
13.0V	30%
12.9V	20%
12.8V	17%
12.5V	14%
12.0V	9%
10.0V	0%

2. Installation

2.1 Tools and Equipment

Prior to installation, ensure the use of appropriate safety equipment, including insulated gloves, safety shoes, and insulated tools, to safeguard against electric shock, injury, or equipment damage.



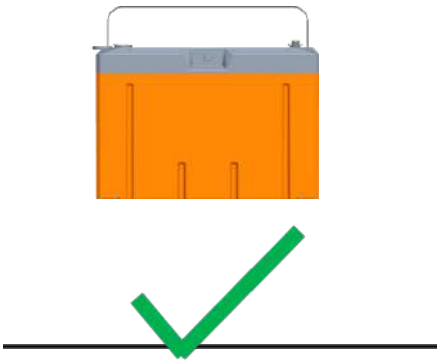
Insulated Gloves

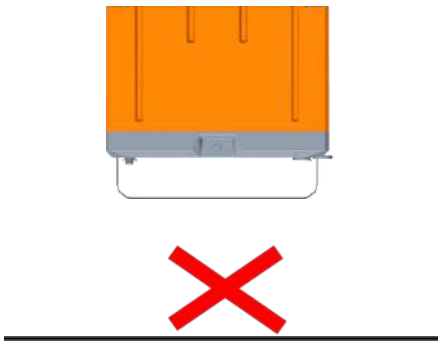
Safety Shoes

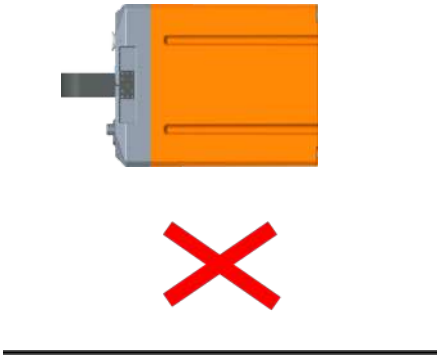
Insulated Tools

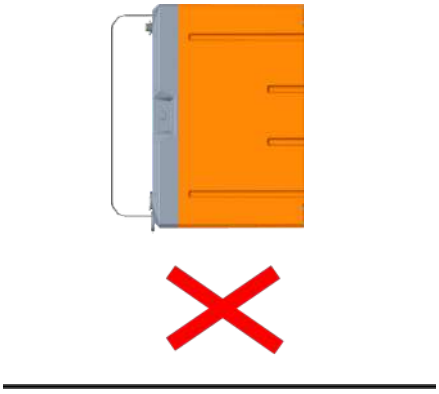
2.2 Battery Placement

This product must be installed in a face-up orientation on a stable and level support surface. Do not position on its side or upside down. Do not place any objects, covers, or additional loads on top of the battery.









2.3 Component List

SN	Component	Chart	QTY	Description
1	Inter-Communication Cable		1	20" (500mm) long, M12 circular communication interface at both ends
2	Battery		1	12.8V 100Ah 12.8V 300Ah 12.8V 460Ah
3	Screw		2	M8 * 16 stainless steel screw
4	Bracket		4	Provides a secure method for fixing the battery to the ground **(Only for DD100-12 & DD100-12H)**
5	Busbars		2	Combines the two terminals (**Only with DD300-12, DD30012H, DD460-12 & DD460-12H)**

2.4 Battery Module Information

Interface	Name	Description
A	Heat Sink	Dissipates heat during operation. **Caution:** The Heat sink can become hot; avoid direct contact immediately after operation.
B	Pole Terminals (M8)	Positive and negative terminals including protective covers.
C	Display Panel	Indicator lights (RUN/ALM, SOC Indicator, CONFIG Button).
D	Power Switch	On - Activates BMS and enables operation. Off - Places the battery into sleep mode.
E	Label	Mechanical and performance parameters.
F	Handle	Provides for safe lifting and handling. **Caution:** Securely grip all handles before moving the unit.
G	Communication Ports	Dual CAN-bus ports for battery-to-battery/system communication and firmware updates.
H	Pressure Relief Valve	Regulates internal pressure during charge/discharge. Keep area unobstructed. Rated IP67.
I	Mounting Bracket	Secures the battery for stationary or vehicle use. Use M6 stainless steel screws.

2.5 Display Panel

Table 2: Explanation of Indicator Lights

Indicator	Condition	Behavior
Indicator Light 🟢	Normal Operation	Flashing During Blink 1
Indicator Light 🔴	Fault/Alarm Active	

Blinking Mode	Lighting Time	Off Time
Blink 1	0.25s	3.75s
Blink 2	0.5s	0.5s

Status	Charge				Discharge			
SOC	L1 🟢	L2 🟢	L3 🟢	L4 🟢	L1 🟢	L2 🟢	L3 🟢	L4 🟢
0 ≤ SOC ≤ 25%	blink2	off	off	off	on	off	off	off
25 < SOC ≤ 50%	on	blink2	off	off	on	on	off	off
50 < SOC ≤ 75%	on	on	blink2	off	on	on	on	off
75 < SOC ≤ 100%	on	on	on	blink2	on	on	on	on

CONFIG Button Operation

- Press and hold for 1 second to display the battery State of Charge (SOC).
- Press for more than 10 seconds to match the address of the battery and form a network.
- Press and hold for more than 10 seconds to set the battery address and enable networking.

3. Series and Parallel Connection

3.1 Introduction

This battery supports series, parallel, or combined series-parallel connections to achieve different system voltages and capacities.

When Using Multiple Batteries:

- Both the power cables and communication cables must be connected.
- Communication lines allow data exchange for accurate monitoring and control.
- One battery is designated as the Master, all others act as Subs. The Master aggregates system data and communicates with external devices (e.g., inverters, displays, MPPT controllers).

The following requirements must be observed before connecting batteries in series or parallel:

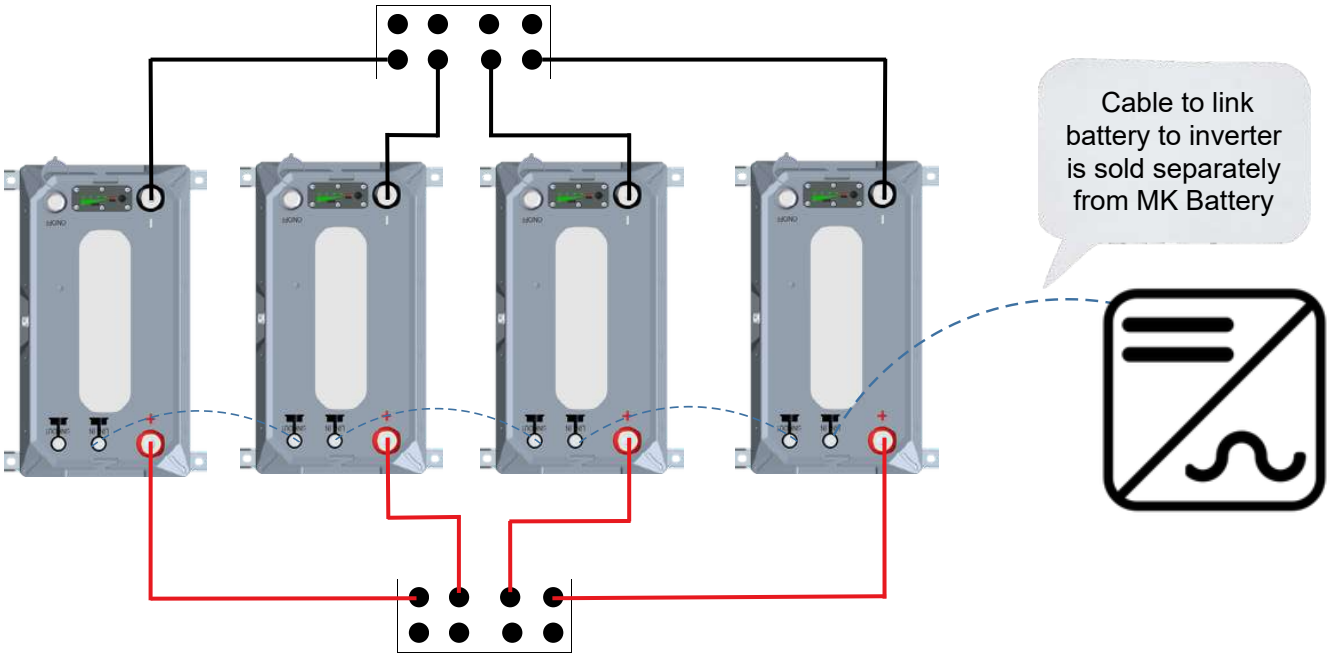
Requirements Before Connecting:

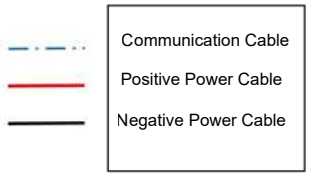
- All batteries must be the same model and specification.
- Parallel cables must be equal length and same gauge to balance the current.
- Recommended charging rate:
  - Charging Current = Rated Capacity × 0.5C
- Terminal busbars must be used to achieve the maximum charge and discharge current ratings for the 300Ah and 460Ah versions.
- Battery voltages must be within 500 mV of each other before connection.
  - Note: Once connected, batteries operate as a single integrated system.

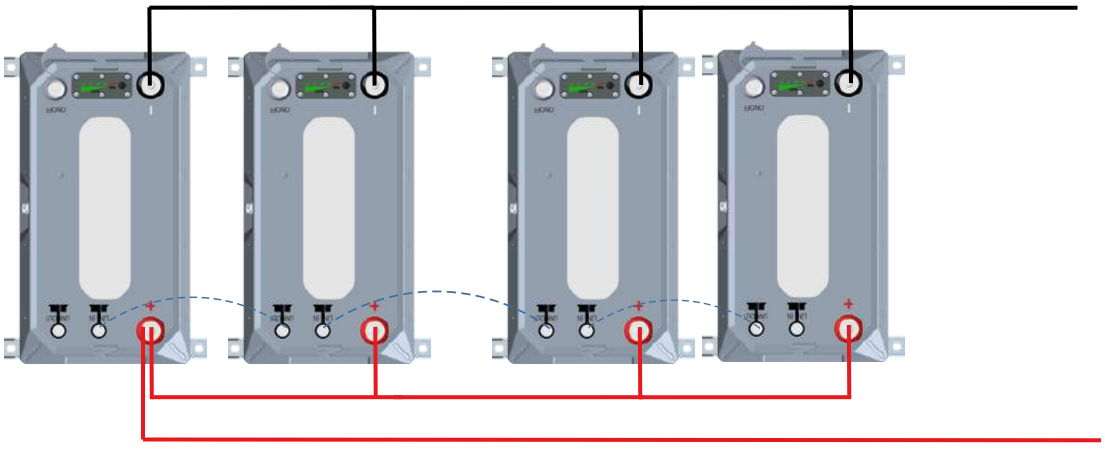
3.2 Parallel Connection Requirements

- A maximum of 16 batteries can be connected in parallel at 12V system voltage. Refer to Diagram 3.4 for the different voltage configurations.
- Verify voltage difference is ≤ 0.5 V using a multimeter or DD-HIM-TAB. If the difference is > 0.5 V, individually charge batteries to full capacity, allow batteries to rest for 1 hour, then reconnect.

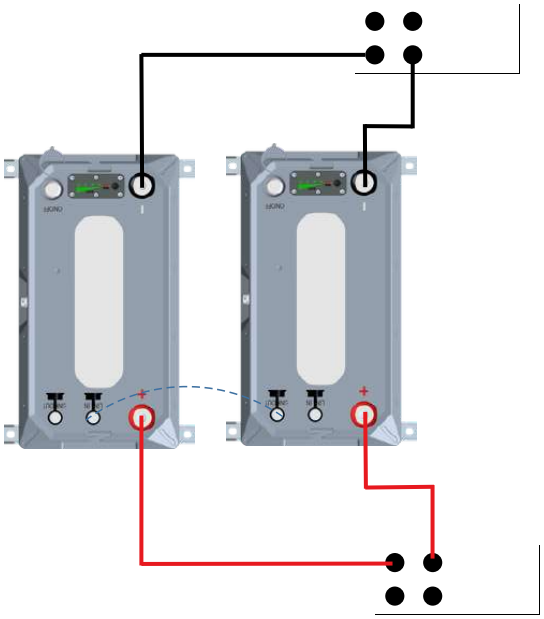
It is recommended to connect the batteries using a common busbar for optimal cell balancing and performance. Daisy-chaining is also acceptable.

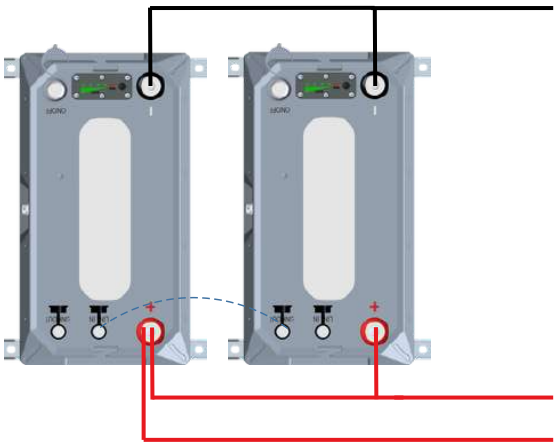






Example: Two 12.8V 100Ah Batteries Used in Parallel Connection.





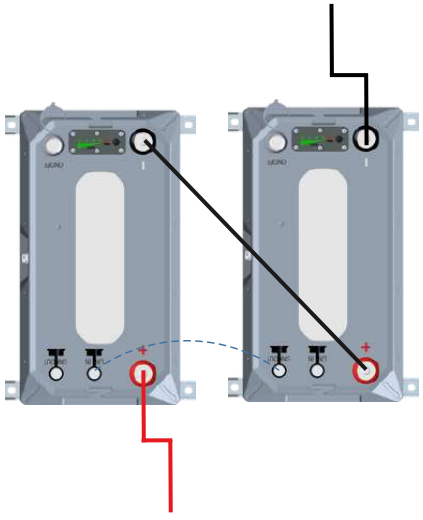
System Voltage: **12.8V**

System Capacity: 100Ah+100Ah=**200Ah**

3.3 Series Connection Requirements

- Up to 4 batteries may be connected in series.
- Verify that the voltage difference is ≤ 0.5 V using a multimeter before connecting. If greater, individually charge batteries to full capacity, allow batteries to rest for 1 hour, then reconnect.

Example: Two 12.8V 100Ah Batteries Used in Series Connection.



System Voltage: **25.6V**

System Capacity: **100Ah**

3.4 Simultaneous Series and Parallel Connection

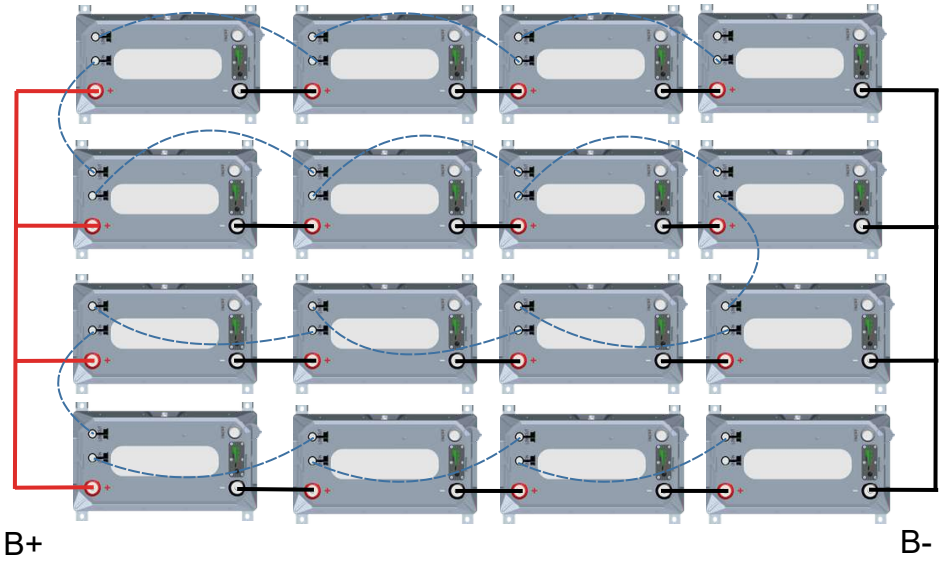
Batteries may be connected in both series and parallel configurations.

- Maximum: 4 batteries in series and 4 strings in parallel.
- Ensure that connections are made in series first, then combine strings in parallel.
- Table: Maximum Parallel Strings by Series Count.

Allowed Series Number	Allowed Parallel Number
1	16
2*	8*
3	4
4	4

*Only allowed without battery-to-battery communication

Example: 16 - 12.8V100Ah Batteries, Connected 4 in Series and 4 in Parallel.



System Voltage: 12.8V * 4 = **51.2V**

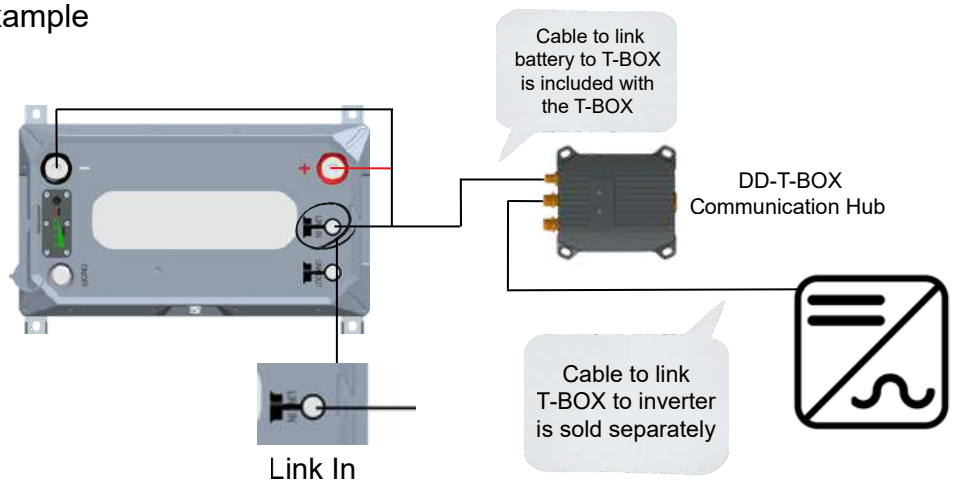
System Capacity: 100Ah * 4 = **400Ah**

3.5 Battery Communication

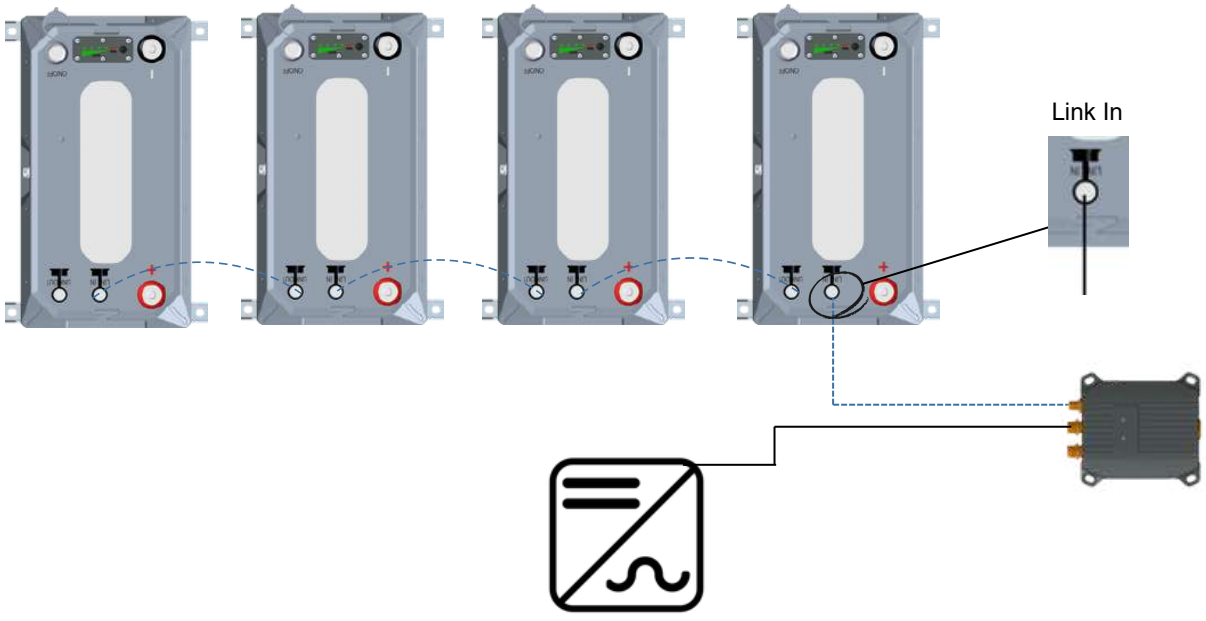
When inverter Modbus communication is required, the DD-T-BOX (Communication Hub) may be utilized. The external communication cable must be connected from the battery's "Link In" port to the DD-T-BOX per diagram below.

Communication Port Connections

Single Battery Example



Multiple Battery Example

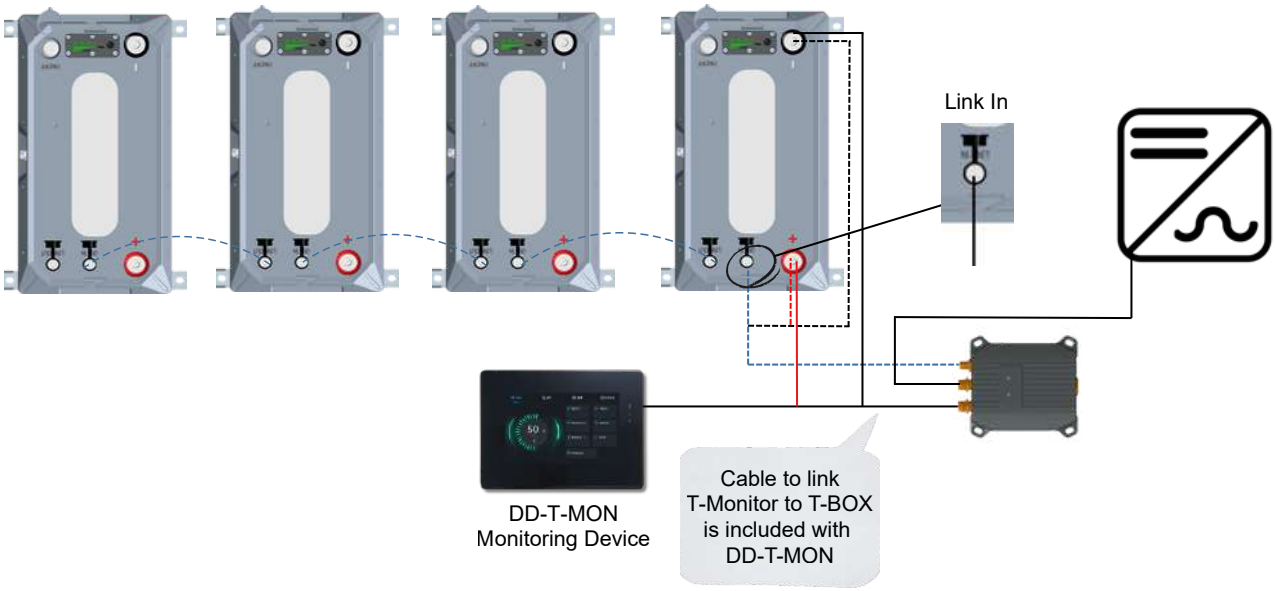


3.5.1 Communication Terminal Connection

- Each battery includes CAN-bus interfaces (Link In / Link Out) using M8 DIN connectors.
- Enables daisy-chain communication between batteries and with external devices.
- Supports system-level data sharing, diagnostics, and monitoring.

- CAN-bus communication is optional – each battery can function independently with its internal BMS.
- Always keep protective covers on unused ports to prevent dust or moisture ingress.

Communication Line Connection Method:



ATTENTION: Always keep the protective black covers installed on the M12 communication connectors when the CAN-bus is not in use.. This prevents damage from dust, moisture, or other environmental contaminants.

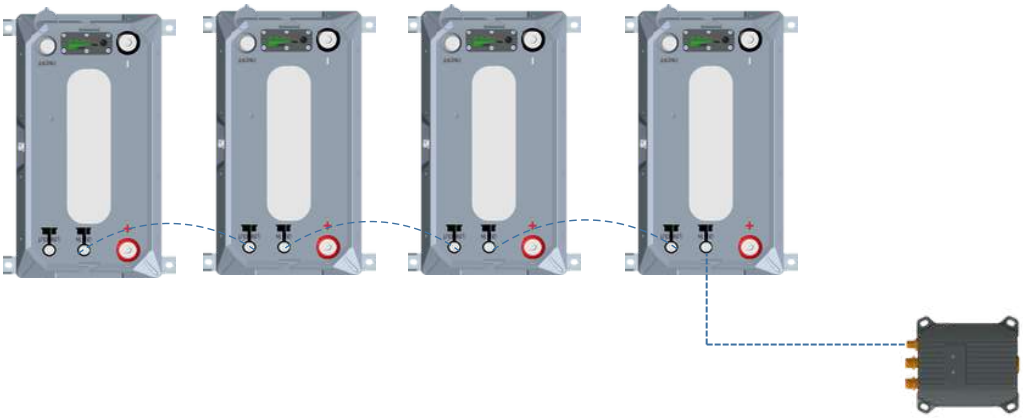
3.5.2 Communication Terminal Connection

Step 1: Wiring Sequence

- Ensure all batteries are OFF.
- Connect in series first, then parallel.
- Follow Sections 3.1 – 3.4 for detailed requirements.

Step 2: Master/Sub Setup

- Battery connected to external equipment = Master.
- All others = Subs.
- Connect Master Link Out → Sub Link In sequentially until all are connected.



Step 3: System Initialization

- Turn all batteries ON.
- On the Master, press and hold CONFIG for ~10 seconds until lights cycle and turn off. This confirms address matching.

ATTENTION:

- Complete series wiring before parallel wiring.
- Do not cross-connect between different series groups.
- Press CONFIG only on the Master battery.
- Pressing CONFIG on Subs will cause communication errors.

4. Maintenance & Storage

4.1 Battery Maintenance

Inspect the conductive strips, voltage terminals, and other connection points for looseness, detachment, corrosion, or deformation. Ensure that battery connections are securely fastened. Perform this inspection at least once every three months.

For charging, periodically check to ensure secure and proper contact between the connection points throughout the process. Any faults must be corrected before continued charging.

It is recommended to clean the product using a vacuum cleaner. Avoid using water or any moisture-containing materials to prevent electrical hazards and damage.

4.2 Transportation and Storage

- **Stacking Limitation:** Do not stack more than six units. Always stack in the upright position.
- **Power State:** For transportation or long-term storage, set the battery to the OFF position.
- **State of Charge (SOC):** Batteries should be stored and transported at approximately 30% SOC.
- **Handling:** Protect the battery from severe vibration, impact, or mechanical compression.
- **Environmental Protection:** Ensure the battery is shielded from direct sunlight, rain, and other environmental exposure.
- **Storage Environment:** Store the battery in a dry, clean, and well-ventilated indoor location.
- **Temperature Range:** Recommended storage temperature is 59°F to 95°F (15°C to 35°C).
- **Extended Storage:** Check the battery State of Charge (SOC) every three months. When the SOC drops to 10%, recharge the battery to 30%.
    - Use the DD-T-MON for an accurate SOC reading.

ATTENTION: Failure to follow these guidelines will void the warranty and may result in reduced service life, capacity loss, or permanent battery damage.

4.3 Recycling and Waste Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations. Batteries must not be disposed of with regular household or industrial waste.