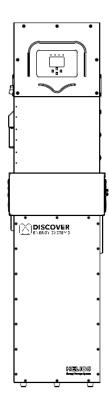


HELIOS ESS Sol-Ark 15K-2P-N Conduit Box Manual

Revision E

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Document: 805-0091 Revision: E

1 INTRODUCTION

The HELIOS ESS Sol-Ark 15K-2P-N Conduit Box is an accessory that enables a seamless connection between the Sol-Ark 15K-2P-N Hybrid Inverter and HELIOS ESS Lithium battery. The conduit box hides and protects the wiring in the energy storage system.

Before installation and configuration, consult the relevant product documentation, including Manuals, Application Notes, Installation and Configuration Guides.

This document provides information about connecting the Sol-Ark 15K-2P-N Hybrid Inverter with the Discover Energy Systems HELIOS ESS battery.

Sol-Ark Documentation

Visit http://sol-ark.com for the most recent version of published documents.

 Sol-Ark 15K-2P-N Hybrid Inverter http://www.sol-ark.com/residential/15k-whole-home-inverter/

Discover Documentation

Visit https://www.discoverenergysys.com for the most recent version of published documents.

- HELIOS ESS Installation and Operation Manual (805-0090)
- LYNK II Sol-Ark User Manual (805-0038)

2 AUDIENCE, SAFETY, MESSAGES, AND WARNINGS

- Audience
- Warning, Caution, Notice, and Note Messages
- General Warnings
- Safe Handling Procedures
- Personal Protective Equipment
- Emergency Procedure

2.1 Audience

Configuration, installations, service, and operating tasks should only be performed by qualified personnel in consultation with local authorities having jurisdiction and authorized dealers. Qualified personnel should have training, knowledge, and experience in the:

- · Installation and commissioning of electrical equipment.
- Application of electrical codes, safety, and installation standards.
- Analysis and reduction of hazards involved in performing electrical work.
- · Installation, configuration, and maintenance of batteries and energy storage systems.
- Installation and configuration of communication systems, such as CAN and Ethernet.
- Installation and configuration of systems activated by relays.

2.2 Warning, Caution, Notice, and Note Messages

Messages in this manual are formatted according to this structure.



Additional information concerning important procedures and features of the product. Read all the instructions before installation, operation, and maintenance.

Important information regarding hazardous conditions.

🕂 WARNING

Important information regarding hazardous conditions that may result in personal injury or death.

Important information regarding hazardous conditions that may result in personal injury.

NOTICE

Important information regarding conditions that may result in damage to the equipment but not personal injury.

NOTE

Ad hoc information concerning important procedures and features of the battery not related to personal injury or equipment damage.

2.3 General Warnings

ELECTRIC SHOCK AND FIRE HAZARD

- This equipment must only be installed as specified.
- Do not disassemble or modify the battery.
- If the battery case has been damaged, do not touch exposed contents.
- There are no user-serviceable parts inside.

Failure to follow these instructions may result in death or serious injury.

ELECTRIC SHOCK AND FIRE HAZARD

Do not lay tools or other metal parts on top of the battery or across the terminals.

Failure to follow these instructions may result in death or serious injury.

ELECTRIC SHOCK

- Do not touch the energized surfaces of any electrical component in the battery system.
- Before servicing the battery, follow all procedures to fully de-energize the battery system.
- Follow the "Safe Handling Procedures" below when working with the battery.

Failure to follow these instructions may result in injury.

2.4 Safe Handling Procedures

Before using the battery and any power electronics, read all instructions and cautionary markings on all components and appropriate sections of their manuals.

- · Use personal protective equipment when working with batteries.
- Do not dispose of the battery in fire.
- Promptly dispose or recycle used batteries following local regulations.
- Do not disassemble, open, crush, bend, deform, puncture or shred.
- Do not modify, re-manufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire explosion or other hazards. If the user suspects damage to the battery due to water, heat, or other reason, take it to a service center for inspection.
- Only use the battery for the system for which it is specified.
- Do not lift or carry the battery while in operation.
- When lifting a heavy battery, follow the appropriate standards.
- Only lift, move, or mount following local regulations.
- Take care when handling battery terminals and cabling.
- Only use the battery with a charging system that has been qualified for the system. The use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazards.
- Do not short circuit a battery or allow metallic conductive objects to contact battery terminals.
- Replace the battery only with another battery that has been qualified for the system. Using an unqualified battery may present a risk of fire, explosion, leakage, or other hazards.
- Avoid dropping the device or battery. If the device or battery is dropped, especially on a hard surface, and the user suspects damage, take it to a service center for inspection.

2.5 Personal Protective Equipment

When handling or working near a battery:

- Use Personal Protective Equipment, including clothing, glasses, insulated gloves, and boots.
- Do not wear rings, watches, bracelets, or necklaces.

2.6 Emergency Procedure

Unusual Odor

- If there is a burning smell
 - Turn OFF the power conversion equipment.
 - Call the installer and schedule an immediate inspection.

Fire

- If there is smoke or other signs of fire:
 - Call 911 (or the emergency phone number in your area).
 - If there is an emergency STOP button, press it to shut down the system.
- Do not attempt to put out the fire.
- Do not spray water or other fire retardants.

3 ITEMS SHIPPED IN THE BOX

Confirm the contents of the box. Discover does its best to maintain quality and accuracy in the shipment of its products. If anything is damaged or missing, please contact customer support immediately.

| ltems | Description |
|-------|----------------------------------------------------------------------------|
| 1 | Sol-Ark Conduit Box (compatible with the Sol-Ark 15K-2P-N Hybrid Inverter) |
| 1 | Drilling template |
| 1 | Conduit box accessories • Grommets • RSB 50 x 6 • RSB 35 x 1 |

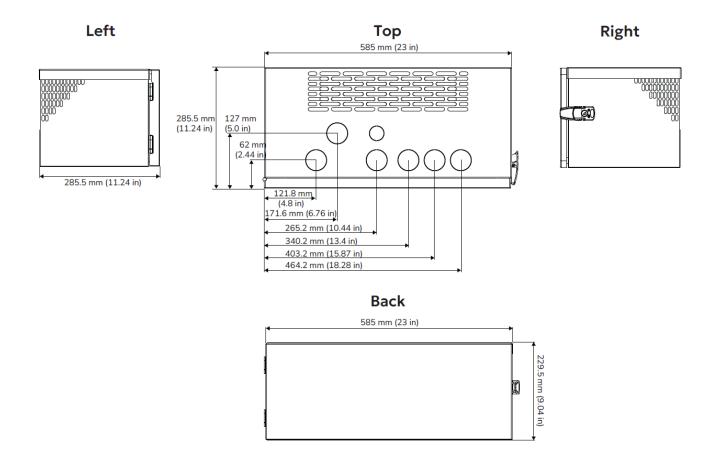
| NOTE |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The HELIOS ESS and the HELIOS ESS Conduit Box do not have battery cables. |
| • The power cables (2 x positive and 2 x negative 2/0 AWG, 200 A Battery to Inverter Power Cables [950-0070]) for connecting the battery to the Sol-Ark 15K-2P-N Hybrid Inverter are sold separately. |
| Paralleling multiple HELIOS ESS batteries through the Conduit Box requires the HELIOS ESS Parallel Wire Kit (Battery to Battery) (950-0068) (sold separately). The Parallel Wire Kit comes with 1 x positive and 1 x negative 2/0 AWG cables (with quick connects on both ends) and a CAT6 or higher cable. |

For the list of accessories for the HELIOS ESS Sol-Ark Conduit Box, refer to Optional Accessories.

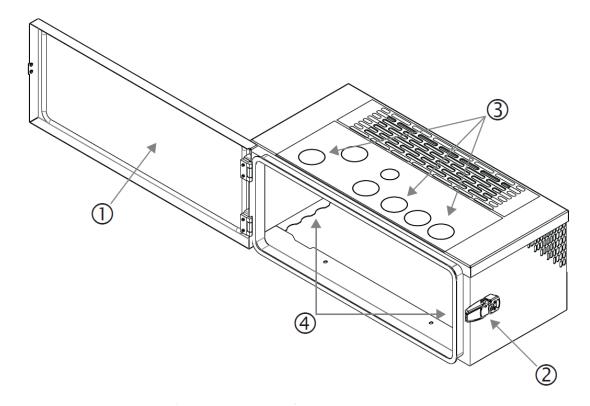
4 SPECIFICATIONS

All specifications in this document are published @25°C / 77°F.

| Specification | 950-0067 | |
|-----------------|------------------------|--|
| Height | 229.5 mm (9.04 in) | |
| Width | 585 mm (23 in) | |
| Depth | 285.5 mm (11.24 in) | |
| Weight | 6 kg (13.23 lb) | |
| Shipping Weight | 9 kg (19.84 lb) | |
| Material | Galvanized Steel Sheet | |



5 CONDUIT BOX FEATURES



| Item | Description |
|------|--------------------------------------------------------------|
| 1 | Front door |
| 2 | Door latch |
| 3 | Knockouts • 6 x 50 mm (1.969 in) • 2 x 35 mm (1.38 in) |
| 4 | Battery terminal access |

6 INSTALLATION

The following instructions describe how to connect a single or multiple HELIOS ESS batteries to the Sol-Ark 15K-2P-N Hybrid Inverter through the HELIOS ESS Sol-Ark 15K Conduit Box. Use these instructions alongside the instructions in the HELIOS ESS Installation and Operation Manual (805-0090).

ELECTRIC SHOCK AND FIRE HAZARD

- This equipment must only be installed as specified.
- Do not disassemble or modify the battery.
- Do not touch exposed contents if the battery case has been damaged.
- · There are no user-serviceable parts inside.

Failure to follow these instructions may result in death or serious injury.

NOTE

It is the responsibility of the installer to ensure that all applicable installation requirements and standards are met.

- Tools
- Optional Accessories
- Installing the Conduit Box
- Wiring

6.1 Tools

- Insulated tools sized to match nuts, bolts, and cables
- Wall stud finder
- Personal protective equipment

6.2 Optional Accessories

The following optional accessories are available for the HELIOS ESS Sol-Ark Conduit Box.

| Accessory | Part Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| LYNK II Communication Gateway | 950-0025 |
| HELIOS ESS Battery to Inverter Power Cables 2 pairs of 200 A cables with lug and quick connect: 2/0 AWG Positive Power Cable (1.0 m, 39.37 inch) 2/0 AWG Negative Power Cable (1.0 m, 39.37 inch) | 950-0070 |
| HELIOS ESS Parallel Wire Kit (battery to battery) 1 pair of 200 A cables with quick connects? 2/0 AWG Positive Battery Cable (1.35 m, 53 in)? 2/0 AWG Negative Battery Cable (1.35 m, 53 inch) CAT6 Cable (1.35 m, 53 inch) (COM3/COM4) | 950-0068 |
| HELIOS ESS Terminal Connector Set | 950-0072 |
| HELIOS ESS Generic Conduit Box | 950-0077 |

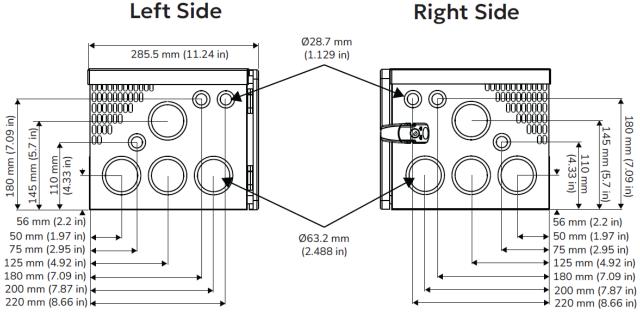
6.3 Installing the Conduit Box

INSTALLATION HAZARDS

- Read the installation instructions in the HELIOS ESS Installation and Operation Manual (805-0090) prior to installing the conduit box.
- The following instructions do not provide the level of detail available in the HELIOS ESS Installation and Operation Manual. Reference the manual when installing the batteries and the conduit box.

Failure to follow these instructions may result in injury.

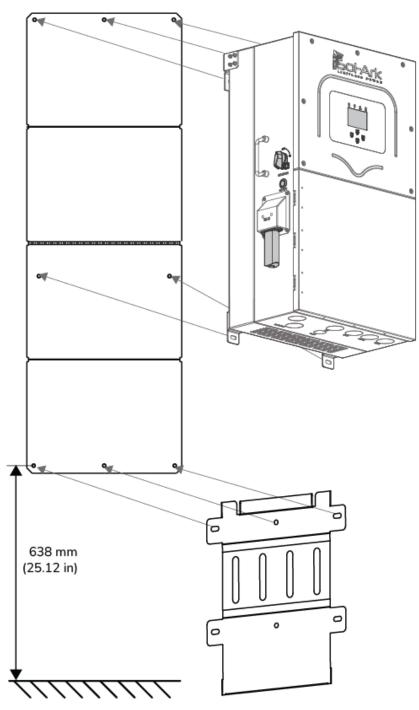
 Prepare the conduit box. If installing multiple HELIOS ESS batteries with conduit boxes, plan on drilling holes on the sides for passing wires and cables between conduit boxes with batteries. The diagram below is an example of the possible hole positions and sizes.



Example Size and Location of Holes (Ø63.2 mm [2.488 in], Ø28.7 mm [1.13 in])

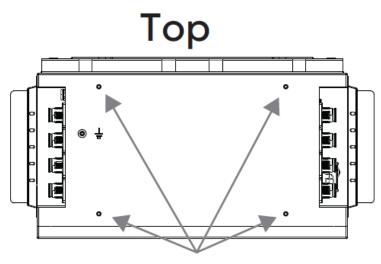
Depending on the installation plan, holes may not be required on both sides of a conduit box, or may not be required at all.

- 2. On the top side of the conduit box, punch out the knockouts required for the two positive and two negative inverter cables and the CAN communication cable.
- Use a stud finder to locate the wall studs.
 Identify a location that optimizes usability and support for the inverter and battery. The battery's Wall-Mount Bracket requires at least 4 bolts supported by wall studs.
- 4. If the wall studs are not in ideal locations, consider adding appropriate structural supports to spread the weight of the 130 kg (286.6 lb) battery and the 62.5 kg (135 lb) inverter.
- 5. Use the template provided with the Conduit Box (see ITEMS SHIPPED IN THE BOX) and mark the location of holes for the battery and inverter wall-mount brackets.



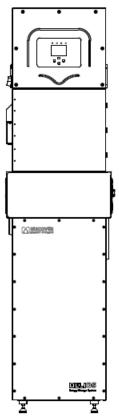
Drilling Template

- 6. Verify the hole marks are level, at the correct height, and in an appropriate location against the wall.
- 7. Drill the holes for screws of the Wall-Mount Brackets of the Sol-Ark 15K-2P-N Hybrid Inverter and HELIOS ESS battery.
- 8. Secure the HELIOS ESS Wall-Mount Bracket to the wall using appropriate fasteners that can support the battery's weight and are compatible with the material of the wall or studs.
- 9. Attach the HELIOS ESS battery to the Wall-Mount Bracket. Refer to the HELIOS ESS Installation and Operation Manual (805-0090) for instructions.
- 10. On the top of the HELIOS ESS battery, unscrew the four conduit box mounting screws.



Conduit Box Mounting screws

- 11. Place the HELIOS ESS Sol-Ark Conduit Box on top of the battery and affix to the battery with the mounting screws.
- 12. Attach the Sol-Ark 15K-2P-N to the inverter Wall Mount Bracket. Refer to the inverter manufacturer's documentation for installation instructions.



Sol-Ark 15K-2P-N Hybrid Inverter and Conduit Box installed on the HELIOS ESS battery

13. Next, wire the batteries and the inverter.

6.4 Wiring

FIRE HAZARD

- Undersized fuses and disconnects may become overloaded and potentially cause a fire.
- Fuses and disconnects are required to open before the cable reaches its maximum currentcarrying capability.

Failure to follow these instructions may result in injury.

ELECTRIC SHOCK AND FIRE HAZARD

- Take precautions to avoid bridging the terminals.
- Do not contact the terminals with metal mountings, fixtures, or body parts.

Failure to follow these instructions may result in injury.

NOTE

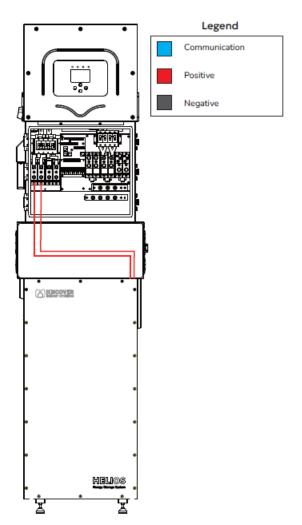
- The Sol-Ark 15K-2P-N hybrid inverter requires two positive and two negative 2/0 AWG cables, as specified in the Sol-Ark documentation.
 - The HELIOS ESS Battery to Inverter Power Cables (950-0070), with two sets of positive and negative 2/0 AWG cables, satisfy Sol-Ark's requirement for the battery to inverter cables.

Refer to the HELIOS ESS Installation and Operation Manual (805-0090) and the LYNK II Sol-Ark User Manual (805-0038) for information on wiring and configuring the batteries and inverter.

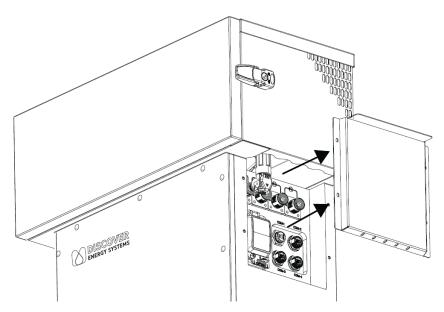
- Wiring a Single Battery
- Wiring Multiple Batteries
- Setting Up Closed-Loop CAN Communication

6.4.1 Wiring a Single Battery

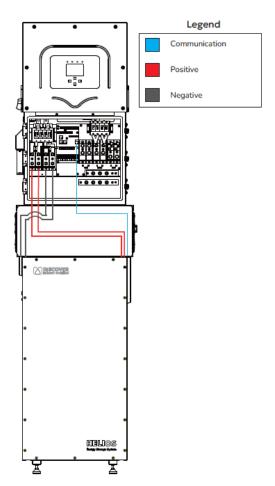
- 1. Pass the two positive battery cables in the HELIOS ESS Battery to Inverter Power Cable set (950-0070), from the inverter and through the conduit box.
- 2. Connect the lugs of these positive battery cables to the inverter's positive battery ports.



3. On the battery, unscrew the battery terminal cover plates to access the positive battery terminals.



- 4. Connect the positive battery cable connectors to the positive terminals on the battery. Push the cable connectors against the receiving pins of the battery to secure the connections.
- 5. Repeat steps 1 to 4 for the negative battery cables (950-0070), connecting to the negative battery ports on the inverter and to the negative terminals on the battery.



- 6. Connect the CAT6 or higher communication cable that came with the HELIOS ESS battery to the inverter's CAN port, and pass the other end of the cable through the conduit box to connect to the battery's COM2 port (CAN port).
- 7. If setting up closed-loop communication without the LYNK II Communication Gateway (950-0025), and the HELIOS ESS battery is supplied with a termination resistor, insert the resistor into either the COM3 or COM4 port.
- 8. Re-attach the battery terminal cover plates.

NOTE

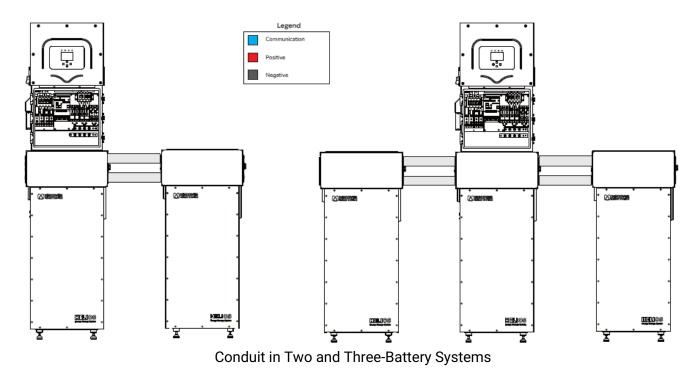
For shipping purposes, the cover plate is attached inside-out. Please attach the cover plate so that it juts out and provides room for the battery and communication cables.

6.4.2 Wiring Multiple Batteries

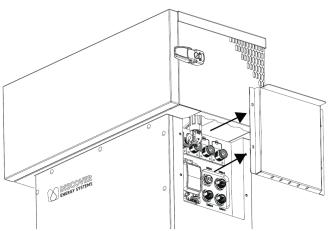
| NOTE |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Sol-Ark 15K-2P-N hybrid inverter requires two positive and two negative 2/0 AWG cables, as specified in the Sol-Ark documentation. |
| The HELIOS ESS Battery to Inverter Power Cables (950-0070), with two sets of positive and negative 2/0 AWG cables, satisfy Sol-Ark's requirement for the battery to inverter cables. |
| Paralleling batteries with the conduit box requires the HELIOS ESS Parallel Wire Kit (950-0068), which includes a pair of 2/0 AWG battery cables (positive and negative) and one CAT6 or higher cable. |
| One parallel wire kit is required to parallel two batteries. Two kits are required to parallel three batteries, which is the maximum number of HELIOS ESS batteries you can connect in parallel with conduit boxes. |
| |

NOTE

In a multiple battery installation with the conduit box, depending on the requirements in your area, you may have to connect conduit between each conduit box for the battery cables (required in the US and in Canada).



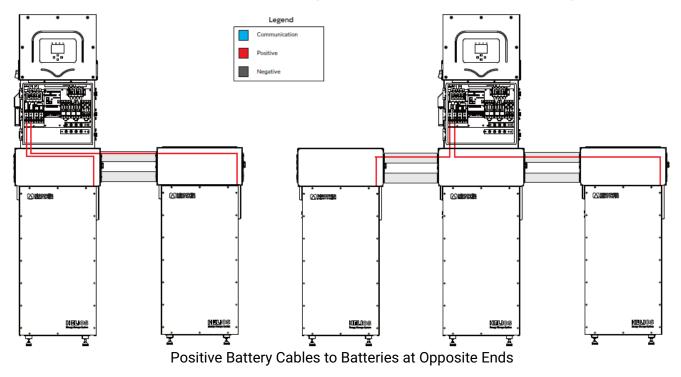
1. On the battery, unscrew the battery terminal cover plates to access the positive battery terminals.



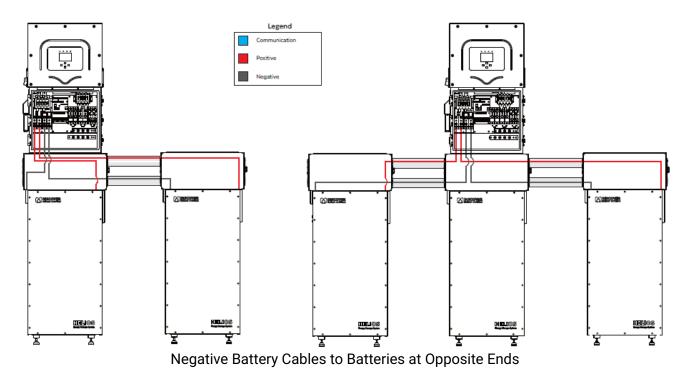
Remove Battery Terminal Cover Plate

2. Pass the two positive battery cables in the HELIOS ESS Battery to Inverter Power Cable set (950-0070), from the inverter, through the conduit box, and out the conduit to the sides of the conduit box, as required.

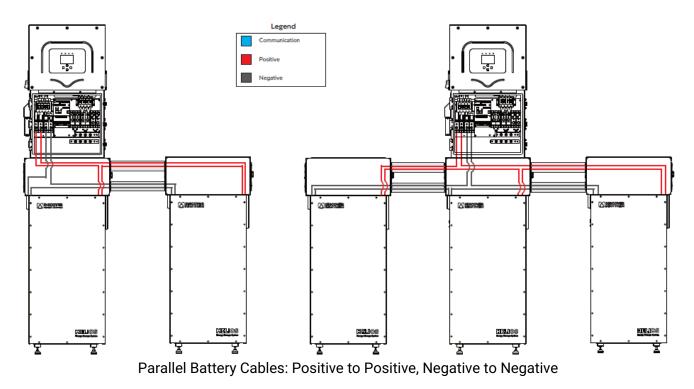
- Connect one of these positive battery cables to a battery on one end of the battery bank, and connect the other positive battery cable to the battery on the other end of the battery bank.
 Push the cable connectors against the receiving pins of the batteries to secure the connections.
- 4. Connect the lugs of these positive battery cables to the inverter's positive battery ports.



- 5. Repeat steps 1 to 4 to connect the negative battery cables (950-0070) to the negative battery ports on the inverter and to the negative terminals on the batteries at opposite ends of the battery bank. Push the cable connectors against the receiving pins of the batteries to secure the connections.
- 6. Connect the lugs of these negative battery cables to the inverter's negative battery ports.



7. Connect the positive battery cable in the HELIOS ESS Parallel Wire Kit (950-0068) to the receiving pins of the positive battery terminals as shown in the following diagrams. Similarly, connect the negative battery cable to the receiving pins of the negative battery terminals as shown in the following diagrams. Push the cable connectors against the receiving pins of the batteries to secure the connections.



8. After all the battery cables are connected, connect the CAN communication cables. (See the next section.)

6.4.3 Setting Up Closed-Loop CAN Communication

There are two ways to set up closed-loop communication between the inverter and batteries.

- Closed-Loop Communication with the LYNK II Communication Gateway (950-0025)
 - The LYNK II Gateway must be purchased separately from your Discover Energy Systems supplier.
- Closed-Loop Communication Without LYNK II Communication Gateway

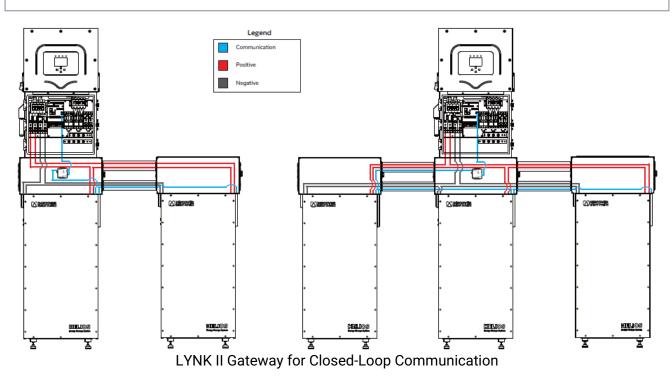
NOTE

Mixing the LYNK Network (LYNK port on the LYNK II and COM3/COM4 on the HELIOS ESS battery) with other networks may result in equipment malfunction and damage.

6.4.3.1 Closed-Loop Communication with the LYNK II Communication Gateway

Connect CAT6 communication cables from the inverter to the LYNK II Communication Gateway and each battery. For more information on setting up communication with the Sol-Ark 15K-2P-N hybrid inverter, refer to the LYNK II Sol-Ark User Manual (805-0038).

- The LYNK II Communication Gateway is terminated internally. When using the LYNK II, a termination resistor at the end of the LYNK Network is not required.
- This connection method requires you to provide one CAT6 or higher communication cable.



- 1. Attach the CAT6 or higher cable that came with the HELIOS ESS, from the inverter's CANbus port to the LYNK II Communication Gateway's CAN port. You can mount the LYNK II to the inside of the Conduit Box.
- 2. Provide a CAT6 or higher cable and connect it from the LYNK II Communication Gateway's LYNK port, to either COM3 or COM4 (LYNK port) on the battery.

3. Network all the batteries by attaching the CAT6 or higher communication cables from the Parallel Wire Kits (950-0068) to the battery COM3 or COM4 ports (LYNK port) on the first battery, to COM3/COM4 on the next battery, and so on, until all the batteries are connected.

6.4.3.2 Closed-Loop Communication Without LYNK II Communication Gateway

Closed-loop communication without the LYNK II Communication Gateway is available with the Sol-Ark 15K-2P-N.

Connect CAT6 or higher communication cables from the inverter to the first battery, then connect the first battery to the second battery, and then the second battery to the third battery. If required, terminate the LYNK network at the last battery.

