

HELIOS ESS SOL-ARK CONDUIT BOX MANUAL

SOL-ARK CONDUIT BOX

950-0067

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PRELIMINARY

Introduction

The HELIOS ESS Sol-Ark 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.

1. AUDIENCE, MESSAGES, WARNINGS, GENERAL SAFETY, PERSONAL PROTECTIVE EQUIPMENT

1.1 Audience

Configuration, installation, 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:

- Installing electrical equipment
- Applying applicable installation codes
- Analyzing and reducing hazards involved in performing electrical work
- Installing and configuring batteries
- Installing and configuring systems activated by remote control

1.2 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.

CAUTION

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

NOTICE

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

NOTE

Ad hoc information concerning important procedures and features unrelated to personal injury or equipment damage.

1.3 General Warnings



Do not crush, disassemble or dispose of the battery in fire or the garbage.



This product is made of recyclable materials and must be recycled.



⚠ WARNING

ELECTRIC SHOCK AND FIRE HAZARD

- This equipment must only be installed as specified.
- Connect the battery to isolated Power Connection Systems (PCS) only.
- Do not install the battery in series.
- Do not disassemble or modify the battery.
- If there is damage to the battery case, do not touch exposed contents.
- There are no user-serviceable parts inside.

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

⚠ WARNING

CHEMICAL HAZARD

Do not touch the exposed contents of a Lithium cell.

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

⚠ WARNING

ELECTRIC SHOCK AND FIRE HAZARD

Do not lay tools or other metal parts across the terminals.

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

⚠ CAUTION

HEAVY OBJECT

Two-person or three-person lift is recommended for the battery.

Failure to follow these instructions may result in injury.

⚠ CAUTION

ELECTRIC SHOCK HAZARD

- 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.

1.4 Safe Handling Procedures

Before using the battery, read all instructions and cautionary markings on the unit and all appropriate sections of this manual.

- Use personal protective equipment when working with batteries.
- Do not dispose of the battery in a fire.
- Promptly dispose of or recycle used batteries following local regulations.
- Do not crush, bend, deform, puncture or shred.
- Do not modify, re-manufacture, or attempt to insert foreign objects into the battery, immerse or expose the battery to water or other liquids, 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.
- The battery is heavy. When lifting the battery, follow appropriate standards.
- Only lift, move, or mount following local regulations.
- Take care when handling battery terminals and cabling.
- Do not expose the battery to high temperatures.
- Do not submerge the battery.
- Do not install the battery with the faceplate down.
- Only use the battery with a charging system that meets specifications. Using a battery or charger that does not meet specifications 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 with only another battery that meets the specifications of the system. Using a battery that does not meet specifications may present a risk of fire, explosion, leakage, or other hazards.
- Do not drop 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.

1.5 Personal Protective Equipment

When handling or working near a battery:

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

1.6 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.

2. DOCUMENTATION

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 [sol-ark.com](https://www.sol-ark.com) for the most recent version of published documents.

- Sol-Ark 15K-2P-N Hybrid Inverter
<https://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 \(805-0038\)](#)
- HELIOS ESS - Sol-Ark Closed-Loop Configuration Guide (805-0097)

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.

Table 2-1, HELIOS ESS Sol-Ark Conduit Box Contents

Items	Description
1	Sol-Ark Conduit Box (compatible with the Sol-Ark 15K-2P Hybrid Inverter)
1	Drilling template
1	CAT6 Cable (30.48 mm, 12 inch)
1	Conduit box accessories <ul style="list-style-type: none">• Grommets<ul style="list-style-type: none">• RSB-50 x 6• RSB-35 x 1

NOTE

- The HELIOS ESS and the HELIOS ESS Conduit Box do not come with 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 Hybrid Inverter are sold separately.
- Paralleling multiple HELIOS ESS batteries through the Conduit Box requires the HELIOS ESS Parallel Wire Kit (Battery to Inverter) (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 [6.2 Optional Accessories](#).

4. SPECIFICATIONS

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

Table 4-1, HELIOS ESS Sol-Ark Conduit Box Specifications

Specifications	950-0067
Height	229 mm (9.016 in)
Width	519 mm (20.433 in)
Depth	278 mm (10.945 in)
Weight	6 kg (13.23 lb)
Shipping Weight	9 kg (19.84 lb)
Material	Galvanized Steel Sheet
IP Rating	

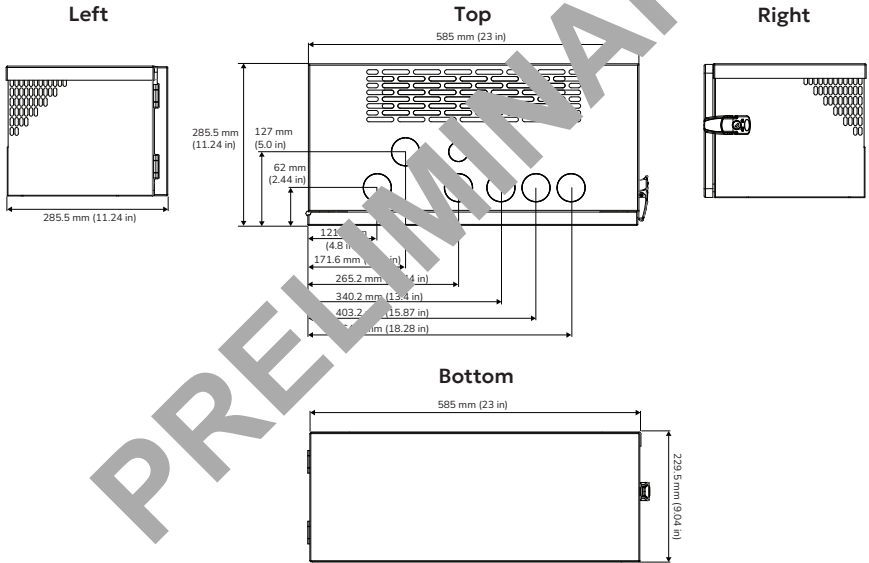


Figure 1. HELIOS ESS Sol-Ark Conduit Box Dimensions

5. CONDUIT BOX FEATURES

5.1 Battery Features

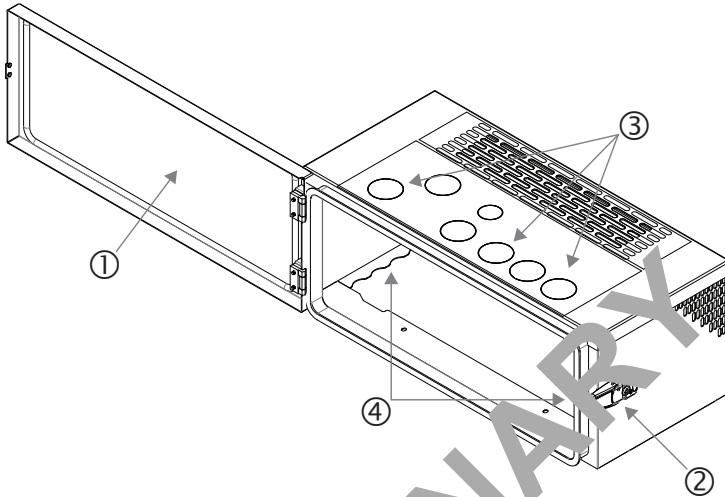


Figure 2. Conduit Box Components

Item	Description
1	Front door
2	Door latch
3	Knockouts <ul style="list-style-type: none">• 6 x 50 mm (1.96 in)• 2 x 35 mm (1.38 in)
4	Battery compartment access

6. INSTALLATION

The following instructions describe how to connect a single or multiple HELIOS ESS batteries to the Sol-Ark 15K-2P 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).

WARNING

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 injury.

NOTE

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

6.1 Tools

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

6.2 Optional Accessories

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

Table 6-1, HELIOS ESS Sol-Ark Conduit Box Accessories

Accessory	Part Number
LYNK II Communication Gateway	950-0025
HELIOS ESS Battery to Inverter Power Cables <ul style="list-style-type: none">• 2 pairs of 200 A cables with lug and quick connect:<ul style="list-style-type: none">• 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

Accessory	Part Number
HELIOS ESS Parallel Wire Kit (battery to battery) <ul style="list-style-type: none"> • 1 pair of 200 A cables with quick connects: <ul style="list-style-type: none"> • 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

6.3 Installing the Conduit Box

⚠ CAUTION

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.

1. Prepare the conduit box. If installing multiple HELIOS ESS batteries with conduit boxes, plan on drilling holes on the side for passing wires and cables between batteries. The diagram below is an example of the holes you may consider.

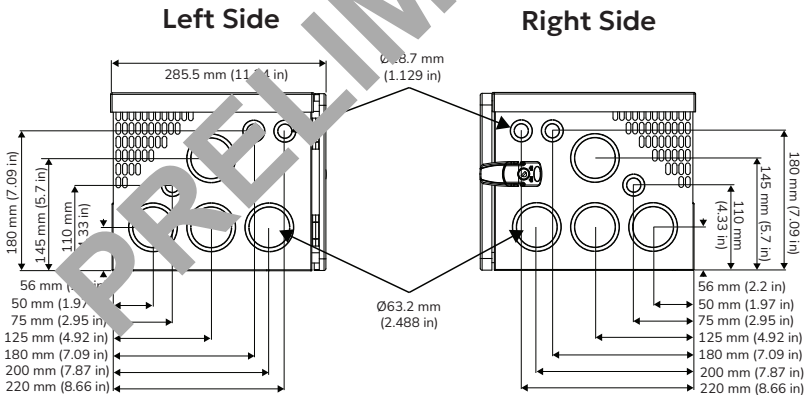


Figure 3. Example Size and Location of Holes ($\varnothing 63.2$ mm [2.488 in], $\varnothing 28.7$ mm [1.13 in])

2. Depending on the installation plan, holes may not be required on both sides of a conduit box.
3. 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.

- Use the template provided with the Conduit Box (see [3. ITEMS SHIPPED IN THE BOX](#)) and mark the location of holes for the battery and inverter wall-mount brackets.

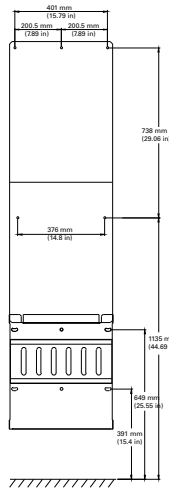


Figure 4. Drilling Template

- Verify the hole marks are level, at the correct height, and in an appropriate location against the wall.
- Drill the holes for screws of the Wall-Mount Brackets of the Sol-Ark 15K-2P Hybrid Inverter and HELIOS ESS.
- 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.
- Attach the HELIOS ESS battery to the Wall-Mount Bracket. Refer to the HELIOS ESS Installation and Operation Manual (805-0090) for instructions.
- Attach the HELIOS ESS Sol-Ark Conduit Box.
- Attach the Sol-Ark 15K-2P. Refer to the inverter manufacturer's documentation for installation instructions.

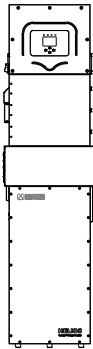


Figure 5. Conduit Box Installed

- Next, wire the batteries and the inverter.

6.4 Wiring

⚠ CAUTION

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 current carrying capability.

Failure to follow these instructions can result in injury.

⚠ CAUTION

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 can result in injury.

NOTICE

- The Sol-Ark 15K-2P 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 Cable (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), the [LYNK II Sol-Ark User Manual \(805-0038\)](#), and the HELIOS ESS - Sol-Ark Closed-Loop Configuration Guide (805-0097) for information on wiring and configuring the batteries and inverter.

6.4.1 Wiring a Single Battery

1. On the top part of the conduit box, punch out only the knockouts required for the two positive and two negative cables and the CAN communication cable.
2. Pass the two positive battery cables from the HELIOS ESS Battery to Inverter Power Cable set (950-0070) from the inverter and through the conduit box.
3. Connect the lugs of these positive battery cables to the inverter's positive battery ports.

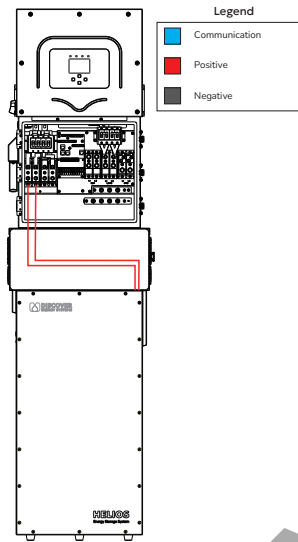


Figure 6. Install Positive Battery Cables in a Single Battery

4. On the battery, unscrew the battery terminal cover plate to access the positive battery terminals.

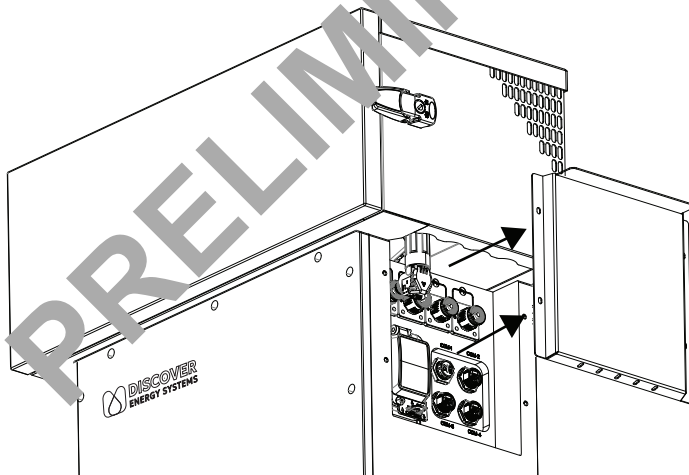


Figure 7. Remove Battery Terminal Cover Plate

5. 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.
6. Repeat steps 2 to 5 for the negative battery cables (950-0070), connecting to the negative battery ports on the inverter and to the negative terminals on the battery.

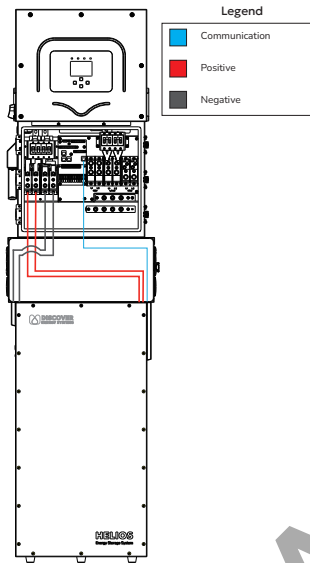


Figure 8. Wiring in a Single Battery Installation

7. Connect the CAT6 or higher communication cable to the inverter 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 CAN port (CAN 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

NOTICE

- The Sol-Ark 5K-2P 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.

1. On the top part of the conduit box, punch out only the knockouts required for the two positive and two negative cables and the CAN communication cable.
2. 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).

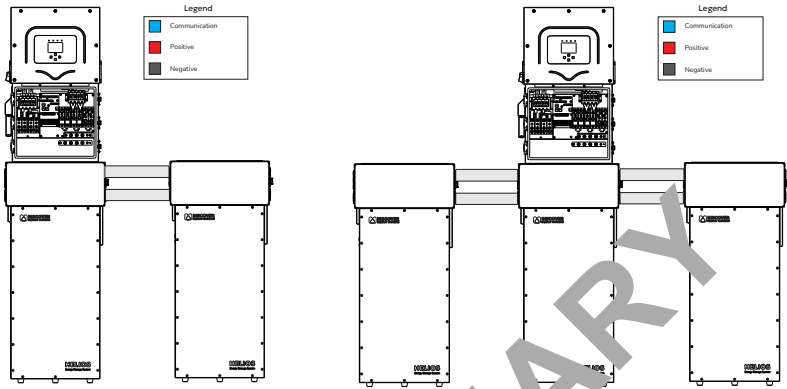


Figure 9. Conduit in Two and Three Battery Systems

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

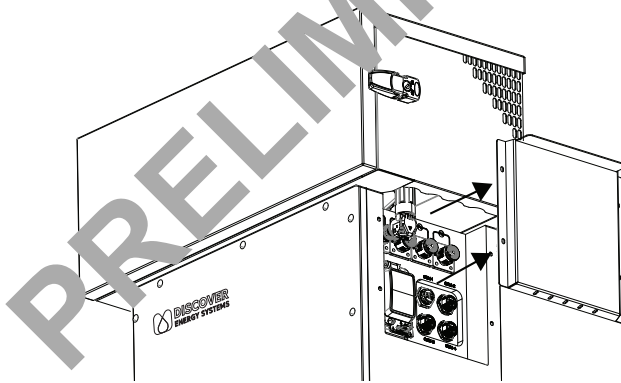


Figure 10. Remove Battery Terminal Cover Plate

4. Pass the two positive battery cables from 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.
5. 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.
6. Connect the lugs of these positive battery cables to the inverter's positive battery ports.

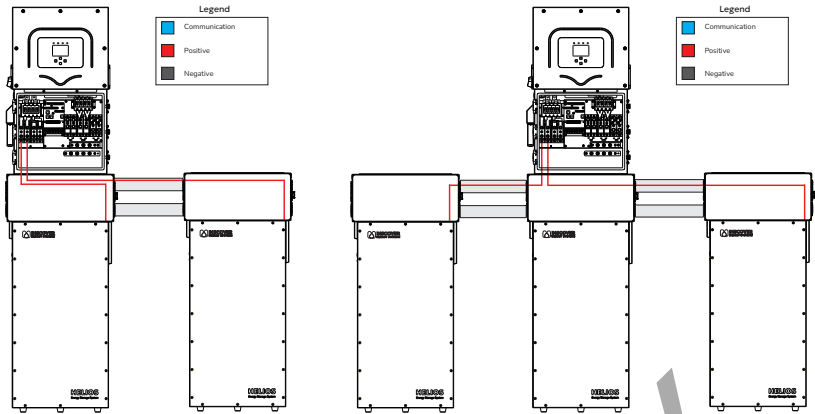


Figure 11. Positive Battery Cables to Batteries at Opposite Ends

7. Repeat steps 3 to 5 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.
8. Connect the lugs of these negative battery cables to the inverter's negative battery ports.

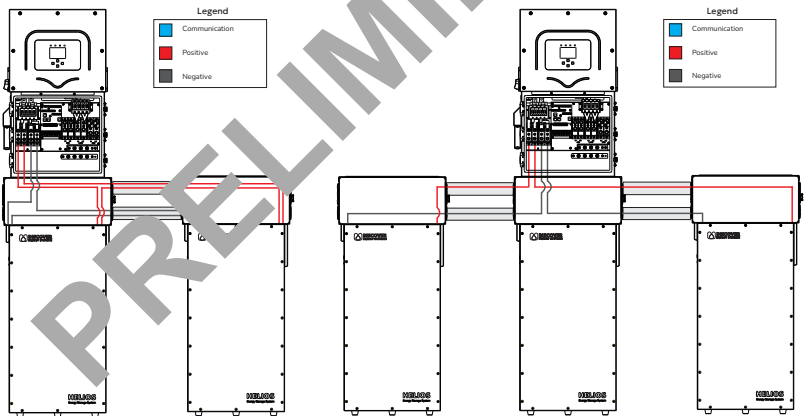


Figure 12. Negative Battery Cables to Batteries at Opposite Ends

9. Connect battery cables between each battery. 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.

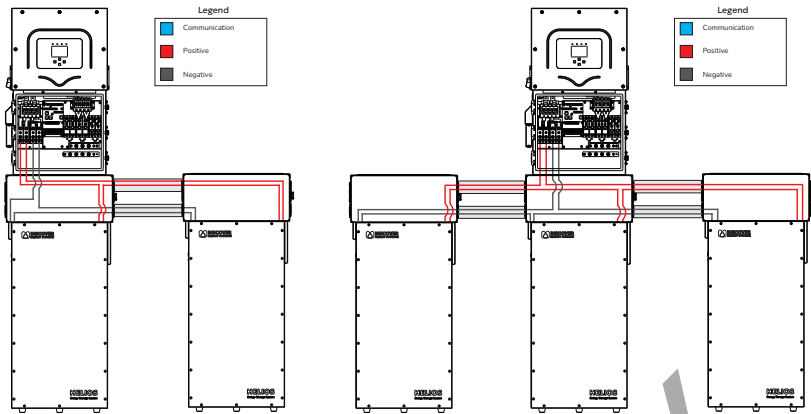


Figure 13. Negative Battery Cables to Batteries at Opposite Ends

10. After all the battery cables are connected, connect the CAN communication cables.

6.4.3 Setting Up Closed-Loop CAN Communication

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

- Without the LYNK II
- With the LYNK II.

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.

NOTE

Termination resistors are not required when networking with the LYNK Network.

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.

1. Attach the CAT6 or higher cable that came with the HELIOS ESS, from the inverter's CANbus port to the battery's COM2 port (CAN port).

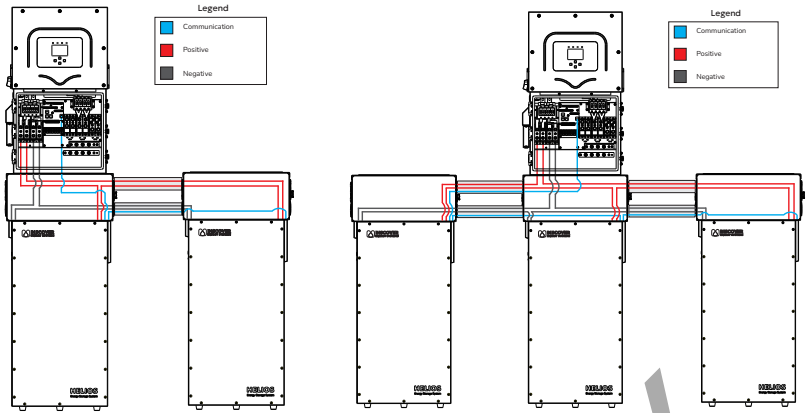


Figure 14. Direct Communication Between Inverter and Batteries

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

Closed-Loop Communication with the LYNK II Communication Gateway

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

NOTE

This connection method requires you to provide one CAT6 or higher communication cable.

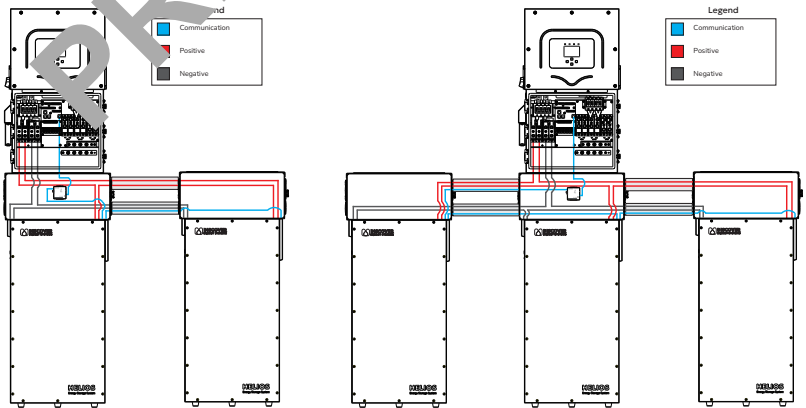


Figure 15. LYNK II for Communication

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 attach the LYNK II in the center of one of the walls inside 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. Interconnect 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.

PRELIMINARY