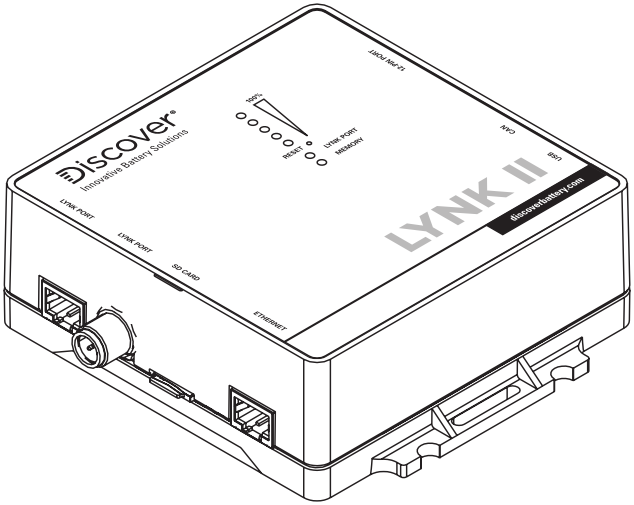
Discover®
Innovative Battery Solutions



LYNK II

(950-0025)

INSTALLATION AND OPERATION MANUAL

805-0033 REV C

1.0. AUDIENCE, SAFETY, MESSAGES AND WARNINGS

1.1 Audience

Qualified personnel should perform configuration, installations, service, and operating tasks in consultation with local utilities 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

1.2 Safety, Messages and Warnings

⚠ 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 result in damage to the equipment but not personal injury.

NOTE

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

2.0 About LYNK II

2.1 Overview

The LYNK II Communication Gateway unlocks the full potential of a Discover lithium battery by enabling the internal Battery Management System (BMS) to communicate closed-loop and in real-time State-of-Charge, voltage, temperature and status to compatible devices, such as solar or mobile inverter-chargers, on and off-board industrial chargers, displays, load centers, motor controls, PLCs and telematics. Serial CAN and CANopen Interface Guides are also available for developers.

2.2 Compatible Batteries and Devices

A battery or device must have a compatible port such as an LYNK Port or AEbus Port to communicate with a LYNK II device.

LYNK Port

- LITHIUM PROFESSIONAL batteries: DLP-GC2-12V, DLP-GC2-24V, DLP-GC2-36V, DLP-GC2-48V, DLP-GC12-12V, DLP-GC12-24V
- DISCOVER HELIOS batteries: 46-24-1540, 46-48-1540

AEbus Port

- AES $LiFePO_4$ batteries: 44-24-2800, 44-48-3000, 42-48-6650, 14-36-3000, 14-48-3000.

2.3 Compatible Communication Protocols

LYNK ACCESS software for 64-bit Windows 10 is required to configure LYNK II devices for communication with compatible external devices such as inverters, chargers and motor controllers. Download the current version of LYNK ACCESS software from the Discover Battery website to obtain the most up-to-date suite of available device configurations. An interface guide for Discover Generic Serial CAN is available from the Discover Battery website.

Partial List of Available Communication Protocol Configurations
Schneider Electric - Xanbus
Schneider Electric - Gateway
Victron Energy - GX and VE.CAN devices
SMA - Sunny Island
Studer Innotec - XcomCan devices
Discover Generic Serial CAN: • Outback Skybox • Sol-Ark
RV-C - Various brands of inverter chargers.
SPE - GREEN Series Industrial Chargers
CANopen - See Discover CANopen Interface Guide

2.4 Firmware Revision

This User Manual is valid for LYNK II firmware version 1.4.0 and above. Use LYNK ACCESS software to view the firmware version of your LYNK II device.

3.0 Items Shipped in the Box

1	Discover LYNK II device (950-0025)
1	USB cable (1 m) with a Type-B mini plug

4.0 Design and Features

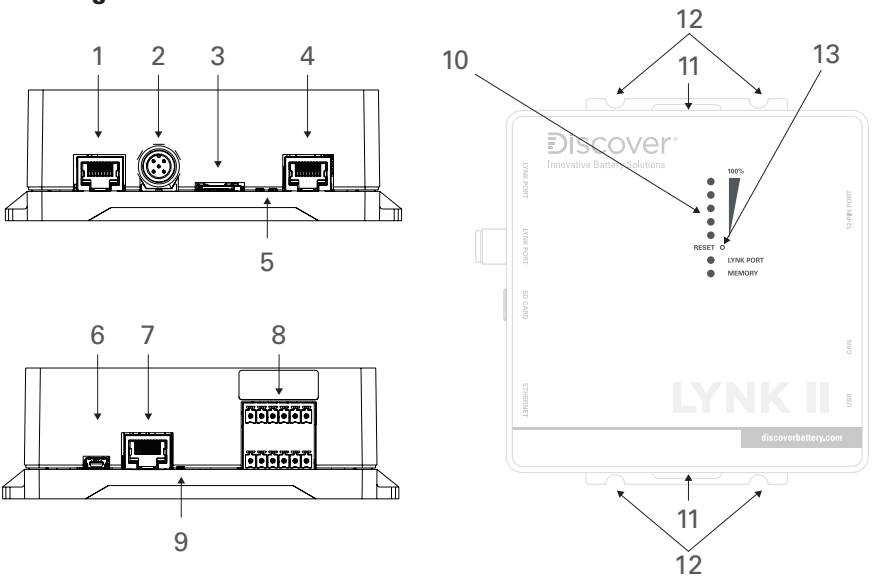


Figure 1. Ports, Buttons, LEDs, and Mounting Hold-Downs

1	LYNK Port (AEbus)	RJ45 connection used for LYNK AEbus Network communication input. Termination is configurable. (Terminated by Default)
2	LYNK Port	IEC M12 PIN connector used for LYNK Network communication input. Termination is configurable. (Terminated by Default)
3	Mini SD Card Slot	Used for extended system data logging (up to 128 GB) and updating battery and LYNK II device firmware.
4	Ethernet Port	Reserved for future functionality
5	Ethernet LEDs	Indicates Ethernet communication activity.
6	USB Mini Port	USB device port used to connect with LYNK ACCESS software on Windows 10 devices.
7	CAN Out	RJ45 connection used for CAN communications. Termination Configurable

8	Phoenix 12-PIN Connector	Connections are used by the relays, CAN Out, and to supply power.
9	CAN Out LED	Indicates communication activity.
10	Status LEDs	Five LEDs indicate the Sate-of-Charge level. LYNK Port LED indicates status and activity on one of LYNK Port or LYNK AEbus Port. Memory LED indicates the status of the SD Card.
11	Hold-Down Points	Hold-Down points for mounting the device with straps.
12	Mounting Slots	Slots for mounting the device with screws or bolts.
13	Reset Button	Pinhole button, press to reset LYNK II

4.1 Reset Button Operation

Press and hold duration	**LYNK II Operation**
5 seconds or less.	LYNK II will restart.

NOTICE
Resetting will automatically restart LYNK II and communications with other devices to be interrupted. Resetting LYNK II will not alter previous settings.

4.2 LED Indicators

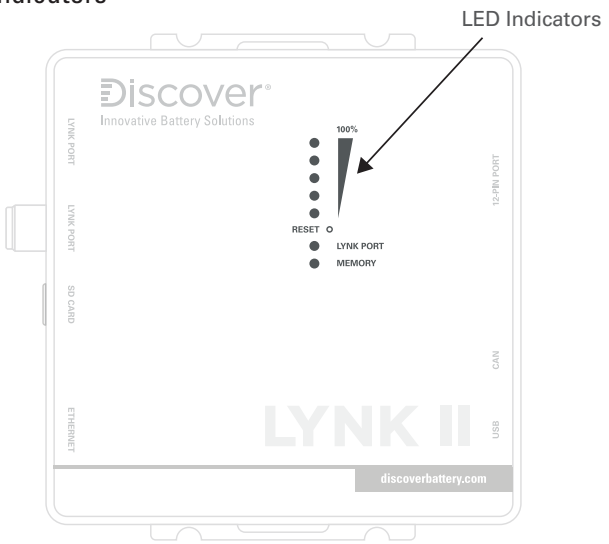


Figure 2: LINK II LED Indicators

State-of-Charge LEDs	Indication
Segment - 5	Solid Green SOC is between 81-100%
Segment - 4	Solid Green SOC is between 61-80%
Segment - 3	Solid Green SOC is between 41-60%
Segment - 2	Solid Green SOC is between 21-40%
Segment - 1	Solid Green SOC is between 6-20%; Flashing Green SOC is 5% or below
Any LED Segment	Flashing once per second indicates the batteries are receiving a charge.
All LED Segments	Flashing two times per second indicates that one or more batteries are in protection.
Alternating Segment 1 through 5	This indicates that LYNK II has power, but no detected batteries are communicating with LYNK II.

Data LEDs	Indication
LYNK Port LED	Flashes when a new battery is detected on one of the LYNK Ports. Solid when there is active communication on one of the LYNK Ports.
Memory LED	Off when no SD card is detected. Flashing when data is being transferred to or from the SD card. Solid when it is safe to remove the SD card.
Ethernet LEDs	Left LED - On when the connection is OK. The right LED - Blink when Tx/Rx Activity.
CAN Out LED	This indicates that a CAN heartbeat message has been received in the proper protocol within the past 5 seconds.

4.3 LYNK Port PIN Assignment

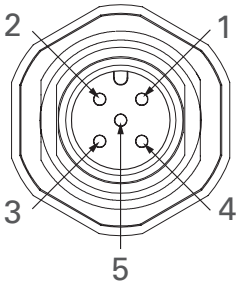


Figure 3. PIN Map M12 A-Code Circular Metric Connector.

PIN	Description
1	Do not populate. Do not terminate to ground. Do not terminate to power. Do not terminate to CAN L or CAN H.
2	AEbus CAN L
3	AEbus CAN H
4	AEbus +12V
5	AEbus GND

4.4 PIN Assignments for Phoenix 12-PIN Connector

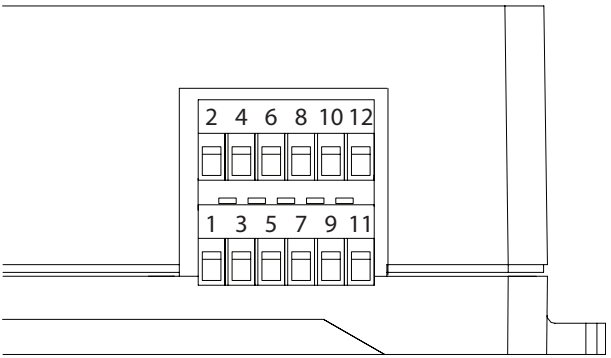


Figure 4. PIN Assignments for Phoenix 12-PIN Connector

12-PIN Connector Layout					
2	**4**	**6**	**8**	**10**	**12**
RELAY 3 COM	RELAY 3 N/O	RELAY 2 N/0	RELAY 2 COM	RELAY 1 N/O	RELAY 1 COM
1	**3**	**5**	**7**	**9**	**11**
CAN HIGH	CAN LOW	CAN GND	POWER GND	POWER Vin (13-90V)	RELAY 1 N/C

4.5 Power Sources for LYNK II

LYNK II can utilize three power sources. All three power sources can be used alone or simultaneously. LYNK II will automatically use the highest priority source.

Priority	**Source**
1	13-90 VDC power supply input connected to PIN 9 (Vin) and PIN 7 (GND) of the 12-PIN connector.
2	AEbus Port or LYNK Port of enabled batteries.
3	USB device (Relays will not function with USB as the only power supply)

NOTE
AES $LiFePO_4$, LITHIUM PROFESSIONAL and DISCOVER HELIOS batteries must be set to ON to supply power and communicate data with LYNK II devices.

LITHIUM PROFESSIONAL and DISCOVER HELIOS Batteries

LITHIUM PROFESSIONAL and DISCOVER HELIOS batteries will supply power to LYNK II using the network cable connected to the LYNK Port.

AES $LiFePO_4$ Batteries

AES $LiFePO_4$ batteries sold after Jan 1, 2020, will supply power to LYNK II using the network cable connected to the AEbus Port.

NOTE
AES $LiFePO_4$ batteries sold before Jan 1, 2020, will not supply power to LYNK II using the network cable connection. An external 13-90 VDC power source connected to the Phoenix 12-PIN connector on LYNK II will be REQUIRED for the AES $LiFePO_4$ batteries listed below. • 42-48-6650 with a serial number before DET424820275xxxx • 44-24-2800 with a serial number before DET442420225xxxx

5.0 Installation

Choose a clean, dry, easily accessible indoor location. All the communication ports on the LYNK II are accessible when mounted on a wall. Clearance of at least 100 mm (4 inches) from the connection points on the device is needed to allow for the bend radius of connected cables.

5.1 Mounting LYNK II

Screws or bolts can be threaded through the integrated Mounting Slots to affix LYNK II to a flat surface. Mounting screws, bolts and nuts are not included. Threading straps through the integrated Hold-Down Points can be used to secure LYNK II to an object. Secure all cables to prevent them from working loose or becoming damaged.

5.2 Installing the External Power Source

LYNK II can utilize three power sources. All three power sources can be used alone or simultaneously. LYNK II will automatically use the highest priority source.

Connect LYNK II to one or more of the following:

- A 13-90 VDC power supply (or battery) connected to the Phoenix connector PIN 7 (GND) and PIN 9 (Vin).
- The AEbus Port or LYNK Port of a Discover lithium battery.
- A USB device (Relays will not function with USB as the only power supply)

5.3 LYNK II Network Communication Cables

⚠ CAUTION

HAZARD OF EQUIPMENT DAMAGE

- Do not connect a CAT5 cable from an AEbus Port or LYNK Port to a WAN or MODEM Ethernet port.
- Turn OFF all devices before connecting cables.
- Mixing the LYNK II Network with other networks may result in equipment malfunction and damage.

Failure to follow these instructions can damage equipment.

Networking Guidelines:

- Separate data and power cables and allow for separation between data and power cables. Avoid interference and data corruption caused by running network cables bundled with power cables.
- Allow for LYNK Network cable slack. Ensure that LYNK Network cables are slack and not in tension.
- Isolate the LYNK Network. Do not mix other networks with the LYNK Network.

NOTE

The LYNK II Communication Gateway is internally terminated. A termination resistor is not required.

LYNK (AEbus) Network Installation and Layout for AES LiFePO$_4$ batteries: 42-48-6650, 44-24-2800

Using a CAT5 or better cable, insert one end into the AEbus Port (RJ45) on the LYNK II. Insert the other end of the CAT5 cable into the AEbus Port located on the AES LiFePO$_4$ battery. If there are multiple AES LiFePO$_4$ batteries, series network (daisy-chain) them together and insert the end of the CAT5 from LYNK II into the AEbus Y-Connector at the end of the network, as shown below. The LYNK II Communication Gateway is terminated internally. Termination at the opposite end of the network is also required, as shown.

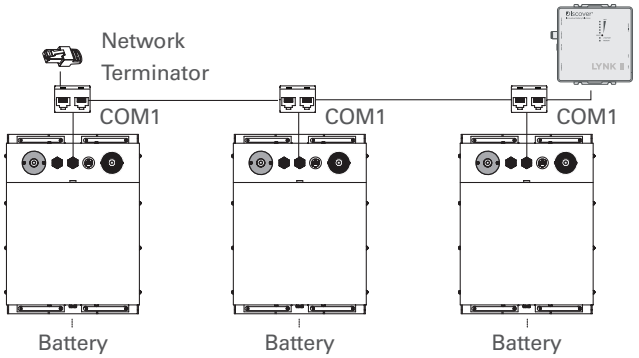


Figure 5. LYNK Network Installation and layout.

LYNK (AEbus) Network Installation and Layout for AES LiFePO$_4$ batteries: 44-48-3000, 14-36-3000, 14-48-3000

Using a CAT5 cable, insert one end into the AEbus Port (RJ45) on the LYNK II. Insert the other end of the CAT5 cable into the AEbus Port located on the AES LiFePO$_4$ battery. If there are multiple AES LiFePO$_4$ batteries, series network (daisy-chain) them together and insert the end of the CAT5 from LYNK II into the AES Port at the end of the series network, as shown below. The LYNK II Communication Gateway is terminated internally. Termination at the opposite end of the network is also required.

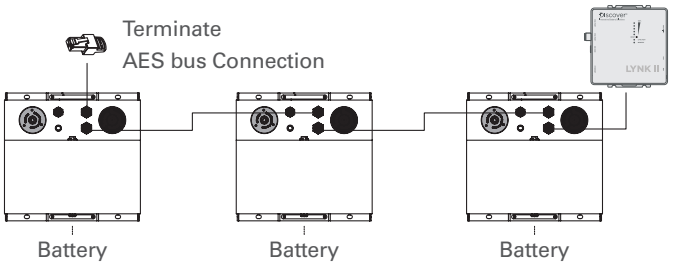


Figure 6. LYNK Network Installation and layout for AES 3K models.

LYNK Network Installation and Layout for LITHIUM PROFESSIONAL and DISCOVER HELIOS batteries:

1. Mount the devices according to their installation instructions before beginning network installations.
2. Attach the 950-0038 DLP T Connector to the LYNK Port on each battery (Figure 7). Ensure that the mating connectors are securely fastened.
3. Insert the male end of the cable into the female end of the 950-0038 DLPT Connector and vice versa.
4. Repeat until all batteries have been attached in a series network (Figure 8).
5. Attach one end of the series network to the LYNK Port on LYNK II. Termination of the other end is not required.

LYNK II Network Cables Available for LITHIUM PROFESSIONAL and DISCOVER HELIOS Batteries	**Part Number**
DLP B2B - 400 (COMM Cable 0.4 m)	950-0035
DLPTOL - 7600 (COMM Cable 7.6 m)	950-0037
DLPTOL - 1800 (COMM Cable 1.8 m)	950-0036
DLPT Connector (COMMT Connector) with DLP B2B-400 (COMM Cable 0.4 m)	950-0038
DLPT Connector (COMMT Connector)	950-0041

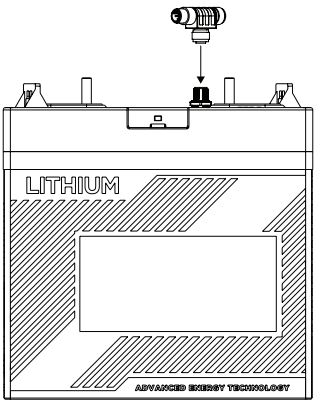
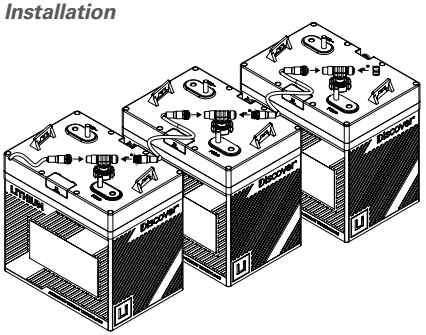


Figure 7. Attaching DLPT Connector to LYNK Port

Figure 8. Network Installation



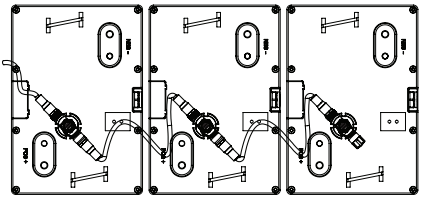


Figure 9. Complete Network Installation

5.4 Verification of the LYNK Network

Verify the LYNK Network is complete using LYNK II.

- An illuminated LYNK Port LED confirms that communications are active for the LYNK Network.
- LYNK ACCESS software can be used via a computer to confirm the number of batteries in the LYNK Network.

6.0 CAN Hardware Termination and CAN Out PIN Configurations

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Disconnect power and all connections to LYNK II before attempting to configure header jumpers.

Failure to follow these instructions may result in damage to the equipment.

6.1 Access to Configuration Headers and Jumpers

To access the configuration headers and jumpers:

1. Disconnect power and all connected cables and wires from LYNK II.
2. Unscrew the case screws using a Phillips screwdriver.
3. Separate the top from the bottom casing.
4. Place the jumpers on the correct headers noted below to configure CAN Termination and CAN Out PINs.

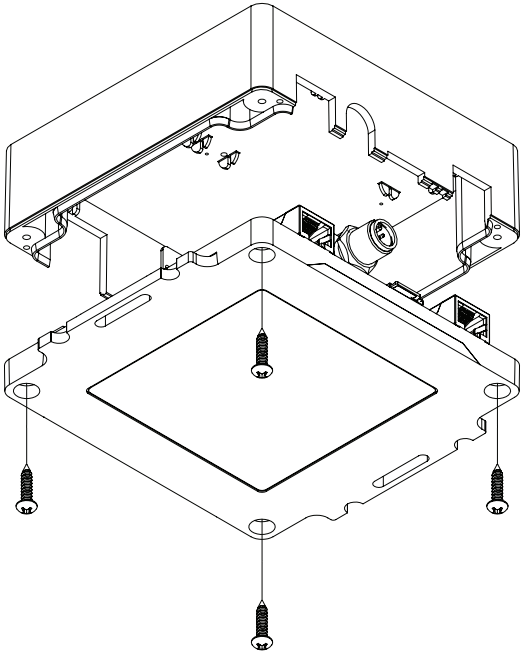


Figure 10. Separating the top from the bottom casing

6.2 CAN Termination

Jumpers are used to configure termination for AEbus and CANBus and the CAN Out PIN assignments.

NOTE
AEbus is terminated by default. Do not remove the AEbus termination jumper for LYNK II unless instructed to do so by Discover Battery.

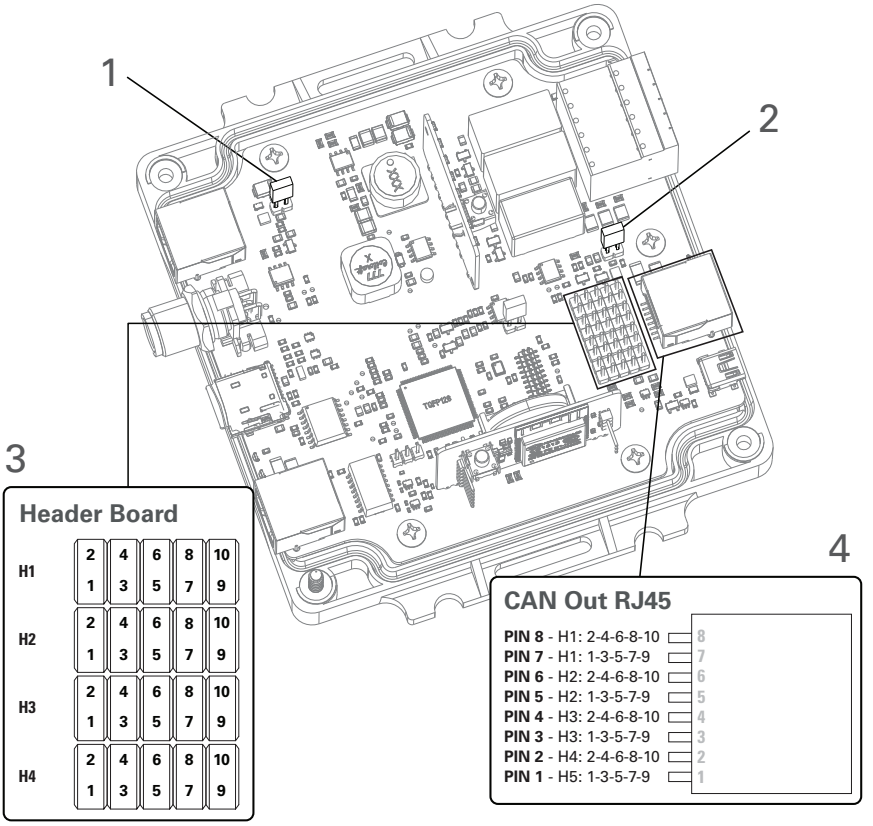


Figure 11. CAN Termination

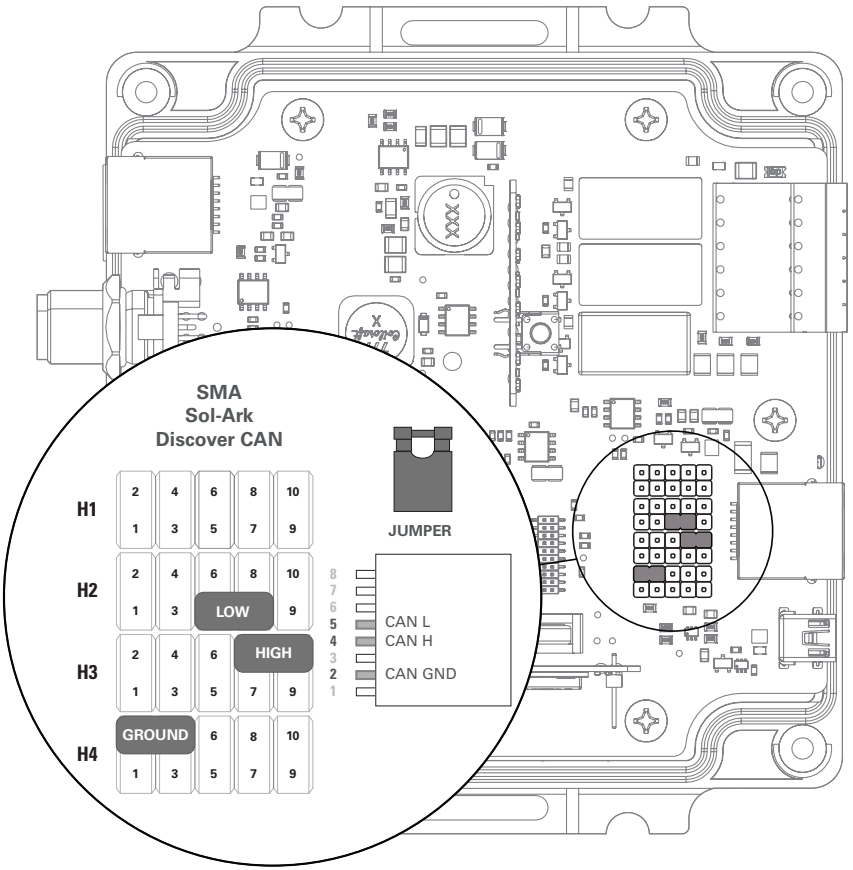
1	AEbus Termination Header	A termination jumper is installed by default.
2	CAN Out Termination Header	A termination jumper is installed by default.
3	CAN Out Configuration Header Board	Jumpers are used to customize the CAN Out RJ45 Port.
4	CAN Out RJ45 PIN Configuration	CAN Out RJ45 PINs mapped to Header Board positions.

6.3 CAN Out - RJ45 Header Assignments

CAN signals (CAN H, CAN L, CAN GND) are assigned to any PIN of the RJ45 connector by adjusting the header board jumpers.

6.3.1 Default PIN assignments:

CAN Out	Header Jumper	RJ45 PIN
CAN L	H2 - 5-7	4
CAN H	H3 - 8-10	5
CAN GND	H4 - 2-4	2



6.3.2 Common PIN assignments:

Victron Energy - Color Control GX, Venus GX, VE.CAN Devices

Studer Innotec - Xcom-CAN Devices

CAN Out	Header Jumper	RJ45 PIN
CAN L	H1 - 6-8	8
CAN H	H1 - 7-9	7
CAN GND	H3 - 1-3	3

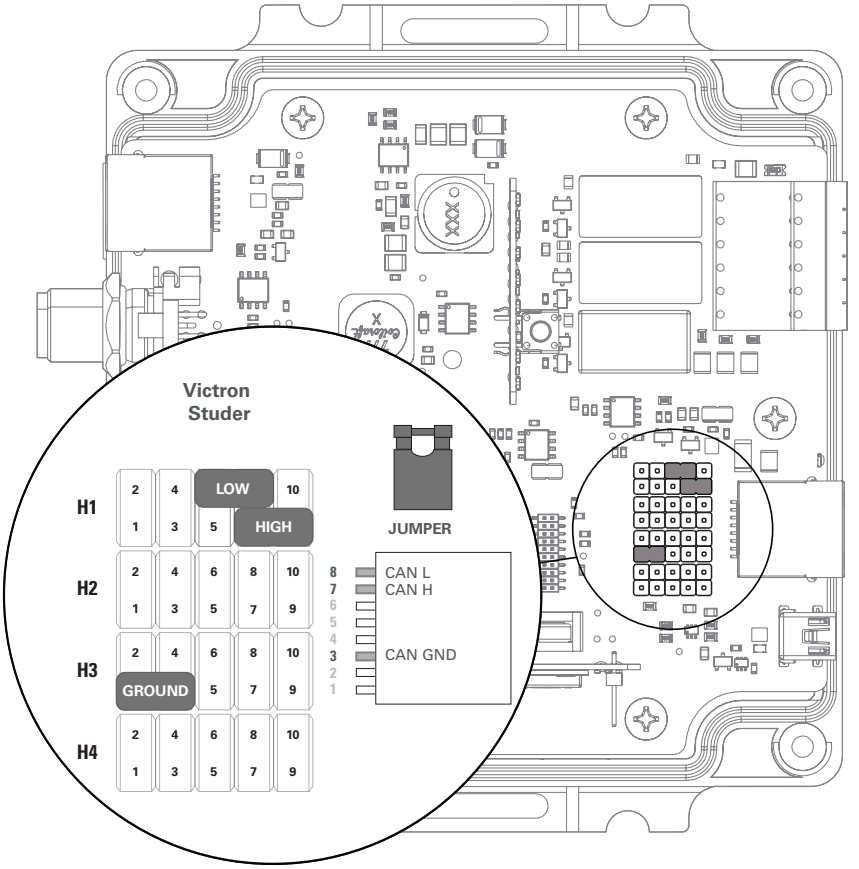


Figure 12. Victron Energy and Studer Innotec PIN assignments

Schneider Electric - Xanbus Devices

Outback Power - Skybox

CAN Out	Header Jumper	RJ45 PIN
CAN L	H3 - 6-8	5
CAN H	H2 - 7-9	4
CAN GND	n/a	n/a

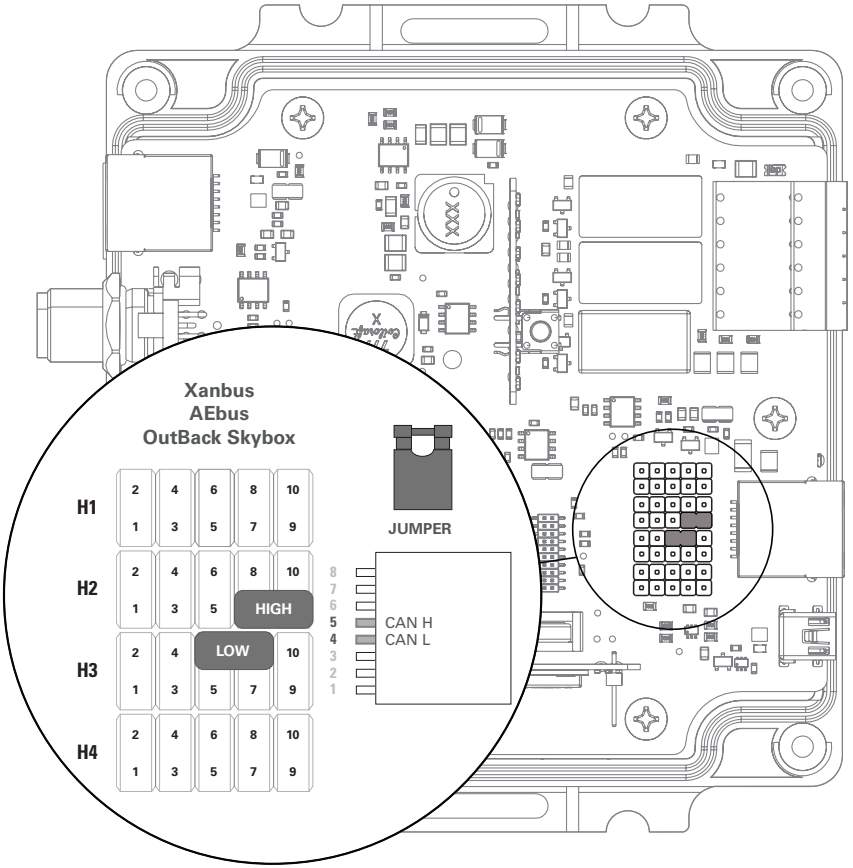


Figure 13. Schneider Electric and Outback Power PIN assignments

SMA - Sunny Island 4.4M, 6.0H, 8.0H, 4548-US, 6048-US

Sol-Ark - 8K Hybrid, 12K Hybrid

Discover Battery Serial CAN (Default)

CAN Out	Header Jumper	RJ45 PIN
CAN L	H2 - 5-7	4
CAN H	H3 - 8-10	5
CAN GND	H4 - 2-4	2

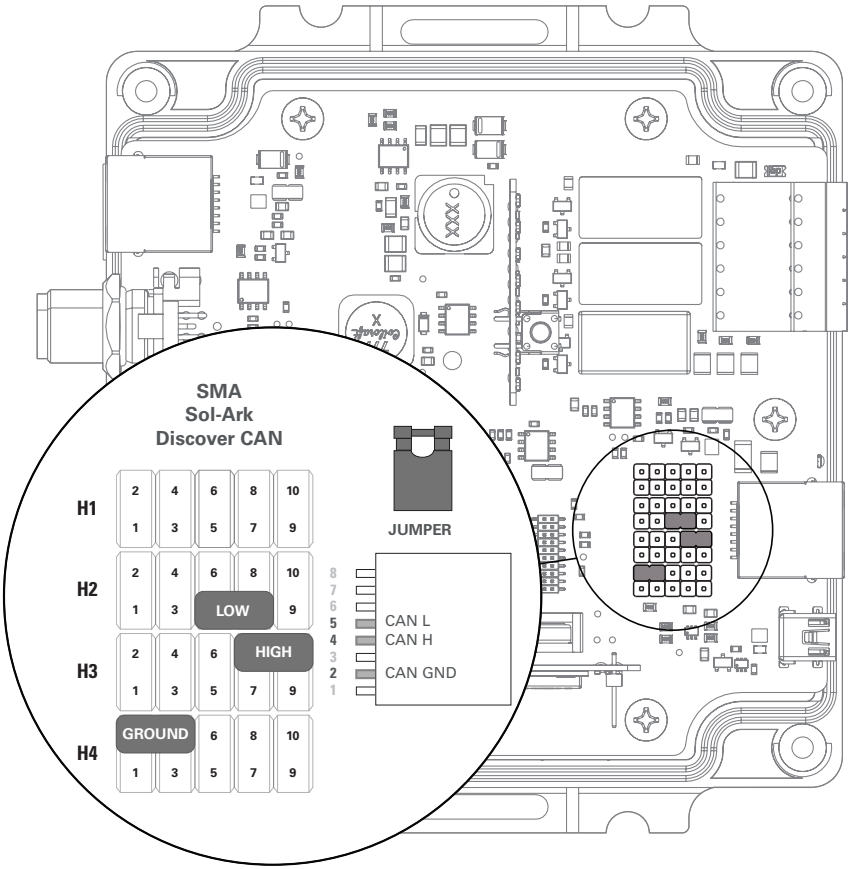


Figure 14. SMA, Sol-Ark and Discover Battery Serial CAN PIN assignments

7.0 Relay Hardware Installation

NOTICE
HAZARD OF EQUIPMENT DAMAGE Protect the relay contacts from over current conditions with an external fuse. **Failure to follow these instructions may cause damage to the equipment.**

The LYNK II relays are by default disabled. Relays 1 - 3 are reserved for future functionality. See the 12-PIN Connector Layout table and figure 15 below for locations of PINs on the Phoenix connector.

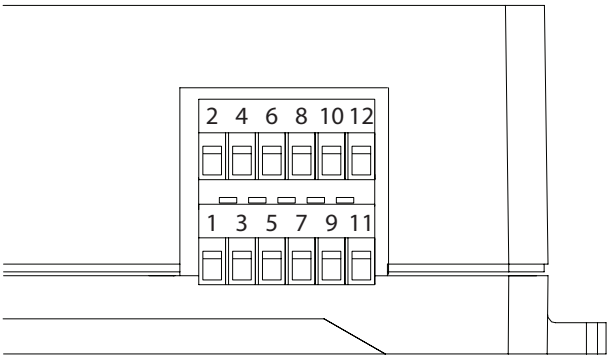


Figure 15. PIN Assignments for Phoenix 12-PIN Connector

12-PIN Connector Layout					
2	**4**	**6**	**8**	**10**	**12**
RELAY 3 COM	RELAY 3 N/O	RELAY 2 N/0	RELAY 2 COM	RELAY 1 N/O	RELAY 1 COM
1	**3**	**5**	**7**	**9**	**11**
CAN HIGH	CAN LOW	CAN GND	POWER GND	POWER Vin (13-90V)	RELAY 1 N/C

Relay	Output Characteristics
Relay 1	Reserved for future functionality
Relay 2	Reserved for future functionality
Relay 3	Reserved for future functionality

8.0 Ethernet Hardware Installation and Layout

NOTICE

HAZARD OF EQUIPMENT DAMAGE

Do not plug a CANBus Terminator into the Ethernet Port of a LYNK II Gateway Device.

Failure to follow these instructions may cause damage to the equipment.

Eithernet is disabled and reserved for future functionality.

9.0 Connecting to LYNK ACCESS

LYNK ACCESS software for 64-bit Windows 10 is required to configure LYNK II devices for CAN communication with compatible external devices such as inverters, chargers and motor controllers.

Download the current version of LYNK ACCESS software from the Discover Battery website to obtain the most up-to-date suite of available device configurations.

Using a USB cable with a Type-B mini plug, connect the 64-bit Windows 10 device running LYNK ACCESS software to the USB port on LYNK II.

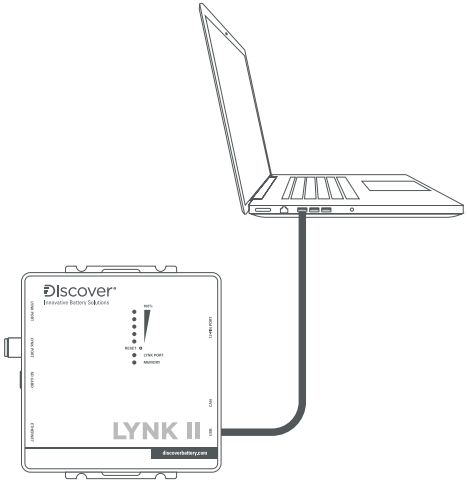


Figure 19. LYNK II and LYNK ACCESS USB connection.

NOTE
A powered USB hub may be required.

Open LYNK ACCESS. LYNK II configurations and settings can be found by selecting the LYNK tab.

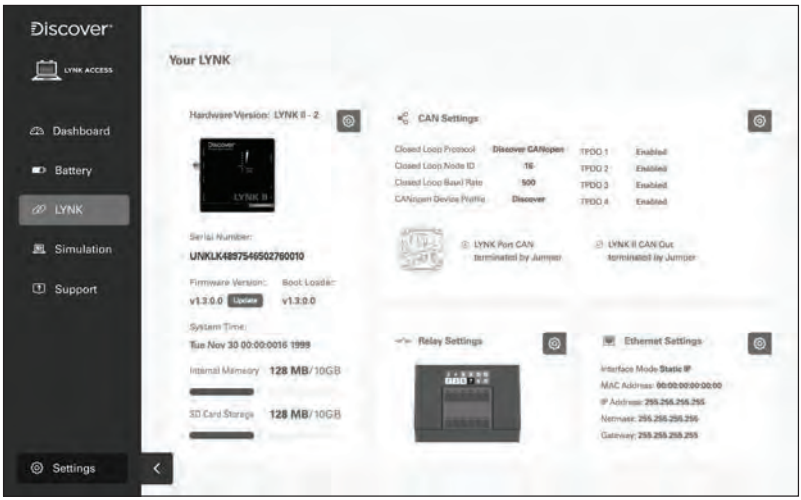


Figure 20. LYNK II configuration and settings screen.

10.0 Configuring the CAN Communication with LYNK ACCESS

Connect the LYNK II and open LYNK ACCESS. Ensure that you only have one LYNK II device connected to the Computer.

Open LYNK ACCESS and select the LYNK tab. Select the blue gear icon in the upper right area of the CAN Settings tile.

Select one of the pre-configured Closed-Loop Protocols to complete the configuration. Click SAVE to confirm the configuration.

Refer to the appropriate application note for instructions on setting the external device to communicate correctly with LYNK II. Up-to-date application notes for various external devices are available from the Discover Battery website.

NOTICE
HAZARD OF EQUIPMENT DAMAGE Saving configuration changes using LYNK ACCESS will automatically restart LYNK II and cause communications with other devices to be interrupted. **Failure to follow these instructions may cause damage to the equipment.**

11.0 Configuring Ethernet Settings with LYNK ACCESS

Reserved for future functionality.

12.0 Configuring Relays with LYNK ACCESS

Reserved for future functionality.

13.0 Updating LYNK II Firmware with LYNK ACCESS

Open LYNK ACCESS and select the LYNK Tab. Select the Firmware Version update button and follow the on-screen prompts to complete the update process. Click SAVE to confirm the configuration.

14.0 Specifications

Device	LYNK II COMMUNICATION GATEWAY
Part Number	950-0025
L x W x H	120 x 135 x 44 mm / 4.7 x 5.4 x 1.7 in
Weight	0.3 kg / 0.7 lb
IP Rating	IP20 (Indoor Use Only)
Temperature Operating	-20°C to 50°C (-4°F to 122°F)
Temperature Storage	-40°C to 85°C (-40°F to 185°F)
Humidity Operating	< 95%, Non-condensing
Humidity Storage	< 95%, Non-condensing
Mounting	Built-in Surface Mount Bracket
Marking	CE

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NOTES