

# LYNK II

(950-0025)

## USER MANUAL FOR SCHNEIDER XW+ WITH INSIGHTHOME (XANBUS)

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READ AND SAVE THESE INSTRUCTIONS

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## Introduction

This Application Note provides information about integrating LYNK and AEBus network-enabled Discover Lithium Batteries using the LYNK II Communication Gateway with Schneider Electric Xanbus-enabled inverter-chargers, solar charge controllers, and other devices.

## 1. AUDIENCE, WARNINGS, MESSAGES, 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 the:

- Installation of electrical equipment
- Application of applicable installation codes
- Analysis and reduction of hazards involved in performing electrical work
- Installation and configuration of batteries
- Installation and configuration of systems activated by relays

### 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 battery features unrelated to personal injury or equipment damage.

### 1.3 General Warnings

#### WARNING

##### **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.**

#### WARNING

##### **ELECTRIC SHOCK AND FIRE HAZARD**

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

**Failure to follow these instructions may result in death or serious 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 and any power electronics, please 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 a fire.
- Promptly dispose of or recycle used batteries following local regulations.
- Do not disassemble, open, 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.
- 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 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 only with another one qualified for the system. Using an unqualified battery 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 rings, watches, bracelets, or necklaces.

## **2. DOCUMENTATION**

This Application Note provides information about integrating LYNK and AEBus network-enabled Discover Lithium Batteries using the LYNK II Communication Gateway with Schneider Electric Xanbus-enabled inverter-chargers, solar charge controllers, and other devices.

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

### **Schneider Electric Documentation**

Visit <https://solar.se.com/> for the most recent version of published documents.

### **Discover Energy Systems Documentation**

Visit <http://discoverlithium.com> for the most recent version of published documents, including Discover Lithium battery user manuals and the LYNK II Installation and Operation Manual (805-0033).

### 3. OVERVIEW

This manual provides general settings and is not a comprehensive guide to the programming and configuration of a specific installation. An installation may have unique conditions or use cases that require modification or adaptations of values. Installers must be capable of reviewing and adapting to the specifics of an installation and its specific use case and optimizing settings where needed.

The key steps required to install and configure the LYNK II Communication Gateway with compatible Discover Lithium batteries and power conversion equipment are as follows:

- Review and confirm equipment compatibility and correct sizing.
- Configure the LYNK II Gateway's CAN Out pins to match the CAN In pins of the power conversion equipment.
- Mount the LYNK II Gateway, connect the Discover Energy Systems communication network to the LYNK Port or AEBus Port, and then connect the CAN Out Port to the power conversion equipment's communication network.
- Terminate all networks correctly.
- Set the LYNK II Gateway using LYNK ACCESS software to the correct protocol to enable closed-loop communication between the Discover Lithium batteries and the power conversion equipment.
- Use the power conversion control system to set up user preferences and enable the use case.

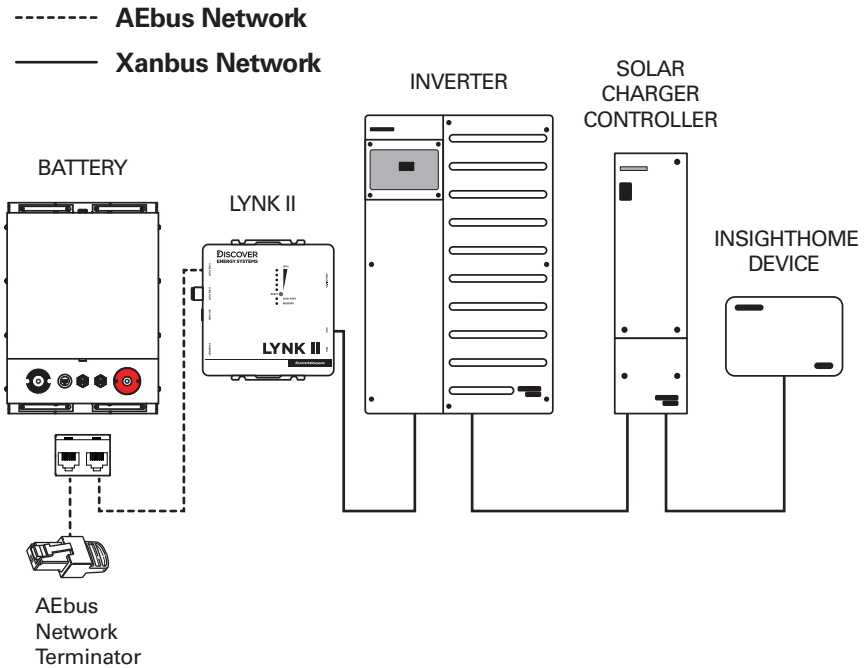
#### 3.1 System Overview

The LYNK II Communication Gateway unlocks the full potential of a Discover Lithium battery by enabling the internal Battery Management System (BMS) to provide real-time data in a closed-loop configuration to other devices. Closed-loop communication allows inverter-chargers and solar charge controller systems to optimize their control over the charging process in solar applications. LYNK II also enables the remote monitoring of Discover Lithium battery state of charge (SOC) and data logging of multiple sites using the data monitoring services offered by off-grid inverter systems.

Discover Lithium batteries must be set up to work with power conversion and monitoring devices in either an open-loop or closed-loop configuration.

During the Discover Lithium battery installation, manually set up charge and discharge settings for an open-loop configuration through the controller for the power conversion device.

In a closed-loop configuration, the BMS of the Discover Lithium battery sends the battery status over a network data connection with the power conversion device. Power conversion devices use the Discover Lithium battery BMS data to fine tune the output of their charger and deliver other functional controls based on battery voltage, temperature, and percent state of charge. If communication between the BMS and the power conversion device is interrupted, the power conversion device uses the charge and discharge settings specified for an open-loop configuration.



*Figure 1. LYNK II System Overview*

### 3.2 Compatible Batteries and Devices

The LYNK II Communication Gateway is compatible with the following:

#### Discover Lithium Batteries

A Discover Energy Systems battery must have a compatible network port such as a LYNK Port or AEBus Port to communicate with a LYNK II device.

- AES LiFePO<sub>4</sub>: 44-48-3000, 42-48-6650
- AES PROFESSIONAL: DLP-GC2-48V
- AES RACKMOUNT: 48-48-5120, 48-48-5120-H

#### Schneider Electric Products

- Conext XW+ 5.5/6.8
- Conext XW+ 7.0/8.5 (Legacy)
- Conext MPPT 60-150
- Conext MPPT 80-600
- Conext MPPT 100-600

To integrate the LYNK II Communication Gateway with XW+ using InsightHome, see the Discover Energy Systems document: 805-0039 LYNK II User Manual - Schneider Electric XW PRO with InsightHome (Xanbus).

## NOTICE

- Conext Battery Monitor is incompatible with the LYNK II Communication Gateway and must not be used on the same Xanbus network.
- Discover Lithium batteries do not support connecting to Schneider Electric XW series or Xantrex XW series power conversion devices.

### 3.3 Minimum Battery System Capacity

The Discover Lithium Battery and Schneider Electric power-conversion device automatically manage battery charge and discharge rates. Using large solar arrays with battery banks that are too small can exceed the operating limits of the battery to charge and possibly lead to the BMS triggering over-current protection. Battery capacity must accept the maximum charge current of the system or curtail the charging to below the operating limit of the installed batteries. Derive this value by adding the charge capacities of all inverter-chargers and solar charge controllers in the system. Additionally, battery peak capacity must support the surge requirements of the load attached to the inverter. Match all inverter peak power values with the sum of all battery peak battery current values.

**Inverter Peak value = (Inverter Surge Value) / (Inverter Efficiency) / (48V: Low Battery Cut-Off)**

Model	Inverter Peak	DC Discharge Continuous Max	DC Charger Continuous Max	AES 7.4 42-48-6650 Minimum per inverter <sup>(5)</sup>	AES 3.0 44-48-3000 Minimum per inverter <sup>(6)</sup>	AES RACKMOUNT 48-48-5120 Minimum per inverter <sup>(7)</sup>	AES PROFESSIONAL DLP-GC2-48V Minimum per inverter <sup>(8)</sup>
XW+ 5548 NA 120/240	220 (60 s) <sup>(1)</sup>	150	110	2	3	2	4
XW+ 6848 NA 120/240	281 (60 s) <sup>(2)</sup>	180	140	2	4	2	5
XW+ 7048 E 230	200 (60 s) <sup>(3)</sup>	150	110	2	3	2	4
XW+ 8548 E 230	265 (60 s) <sup>(4)</sup>	180	140	2	4	2	5

<sup>(1)</sup> Calculated based on max 150 A DC input, 41 A at 240 VAC 60-second output, efficiency 92.5% (CEC), and 110 A DC charger, as published in Schneider Electric data sheets (2017-09).

<sup>(2)</sup> Calculated based on max 180 A DC input, 52 A at 240 VAC 60-second output, efficiency 93% (CEC), and 140 A DC charger, as published in Schneider Electric data sheets (2017-09).

<sup>(3)</sup> Calculated based on max 150 A DC input, 40 A at 230 VAC 60-second output, efficiency 95.8% (Peak), and 110 A DC charger, as published in Schneider Electric data sheets (2017-09).

<sup>(4)</sup> Calculated based on max 180 A DC input, 53 A at 230 VAC 60-second output, efficiency 95.8% (Peak), and 140 A DC charger, as published in Schneider Electric data sheets (2017-09).

<sup>(5)</sup> Discover AES 42-48-6650 Battery, Peak Power: 300 A DC (3 seconds), 130 A DC Continuous Charge/Discharge, as published in Discover AES User Manual (2022-05).

<sup>(6)</sup> Discover AES 44-48-3000 Battery, Peak Power: 219 A DC (3 seconds), 57 A DC Continuous Charge/Discharge, as published in Discover AES User Manual (2022-05).

<sup>(7)</sup> Discover AES 48-48-5120 Battery, Peak Power: 218 A DC (3 seconds), 95A Max DC Charge/Discharge, as published in Discover AES RACKMOUNT User Manual (805-0043 REV D).

<sup>(8)</sup> Discover DLP-GC2-48V Battery, Peak Power: 90 A DC (3 seconds), Max Charge (1 hour): 29 A DC, Max Discharge (1 hour): 58 A DC, as published in Discover DLP-GC2-48V User Manual (2023-08).



## 4. LYNK II CAN HARDWARE TERMINATION AND CAN OUT PIN CONFIGURATION

### 4.1 LYNK II CAN Termination

#### NOTICE

Disconnect power and all LYNK II Communication Gateway connections before configuring header boards and jumpers.

Jumpers configure termination for the AEBus and LYNK Network and the CAN Out pin assignments. Follow the LYNK II Installation and Operation Manual (805-0033) to access and configure the header board with jumpers.

Detailed pin configurations are included in the LYNK II manual but are repeated here for convenience.

#### NOTE

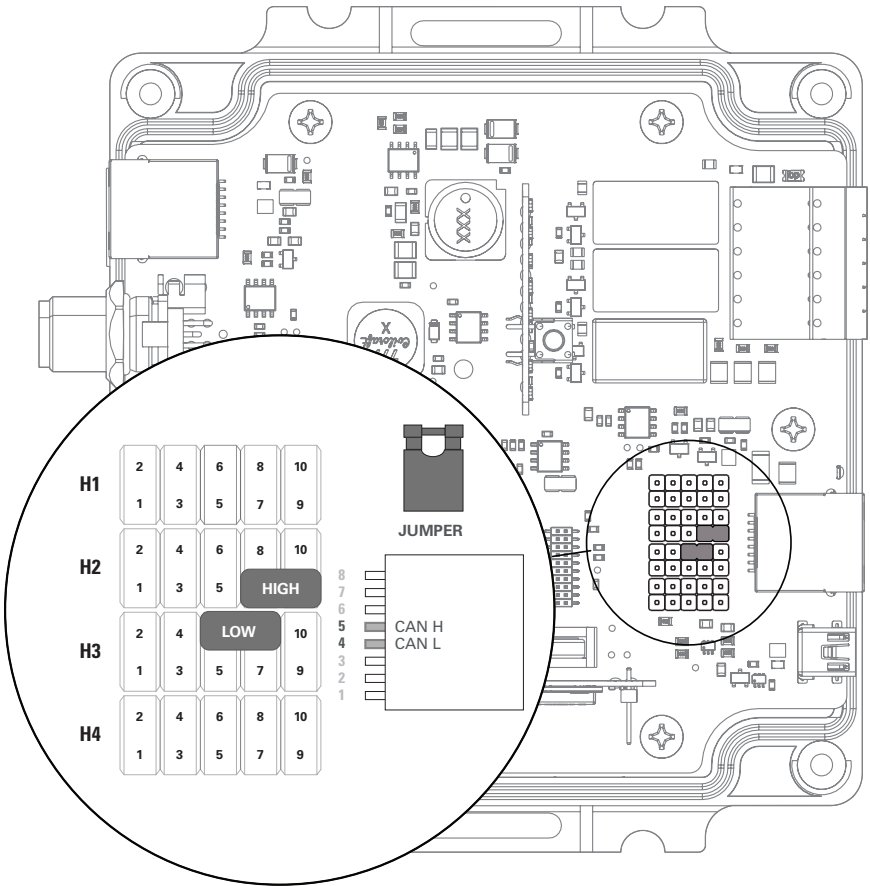
The LYNK II Communication Gateway terminates the AEBus and LYNK Network by default. Do not remove the termination jumper inside the LYNK II Communication Gateway unless instructed by Discover Energy Systems.

### 4.2 LYNK II CAN Out - RJ45 Pin Assignments for Xanbus Inverters

CAN signals (CAN H, CAN L, CAN GND) can be assigned to any pin of the RJ45 connector by adjusting the jumpers on the header board.

#### 4.2.1 Xanbus Pin Assignments

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



**Figure 2. Schneider Electric Power Pin Assignments**

## 5. INSTALLING AND CONNECTING LYNK II TO THE XANBUS NETWORK

### 5.1 Networking Discover Lithium Batteries with LYNK II

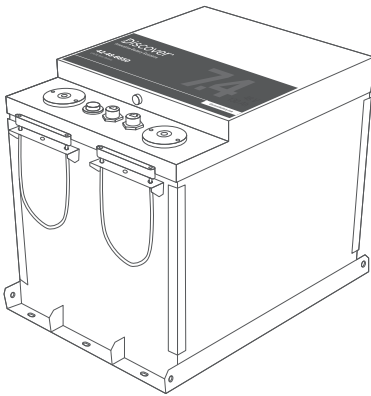
#### NOTICE

- Turn OFF all devices before connecting cables.
- Do not plug an AEBus or LYNK RJ45 network cable or AEBus terminator into the 10/100 Ethernet port of the LYNK II.
- Do not connect a CAT5 cable from the AEBus, LYNK, or Ethernet ports of the LYNK II to a WAN or MODEM port of a network router.
- Mixing the LYNK or AEBus Network with other networks may result in equipment malfunction and damage.
- Unless Discover Energy Systems specifies, do not connect power electronics directly to the LYNK or AEBus network.

Refer to the LYNK II Installation and Operation Manual (850-0033) for instructions on network layouts, connections, and terminations for compatible Discover Lithium battery models. Some key reminders are repeated here for convenience.

- Connect at least one battery to the LYNK Port on the LYNK II communication gateway.
- A network of batteries will communicate as one battery.
- Connect no more than one network of batteries to the LYNK II.
- Network termination is required for the system to function correctly - note some batteries and devices may auto-terminate.
- LYNK II requires power. There are three possible sources: a 13-90 VDC power supply, a USB device, or an AEBus Port or LYNK Port-enabled Discover Lithium battery.
- Discover Lithium batteries must be set to ON to supply power and communicate data with LYNK II.

AES LiFePO<sub>4</sub> batteries are not internally terminated. The LYNK II communication gateway is internally terminated. When using LYNK II with an AEBus network, install a terminator at the end opposite LYNK II.

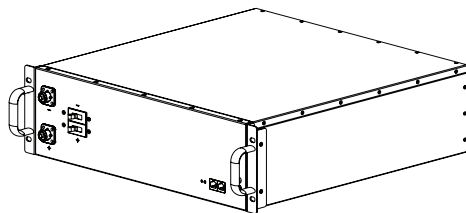


**Figure 3. AES LiFePO<sub>4</sub> Battery**

## NOTE

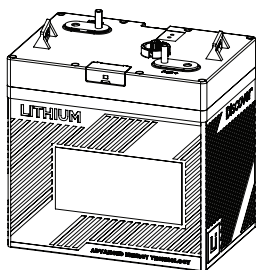
AES LiFePO<sub>4</sub> batteries sold before Jan 1, 2020, will not supply power to LYNK II using the network cable connection. An external 13-90 VDC power source connected to the Phoenix 12-pin connector on LYNK II is REQUIRED for the AES LiFePO<sub>4</sub> battery listed below.

- 42-48-6650 with a serial number before DET424820275xxxx



**Figure 4. AES RACKMOUNT Battery Module**

Both LYNK II and the AES RACKMOUNT Battery Module are internally terminated.



**Figure 5. AES PROFESSIONAL Battery**

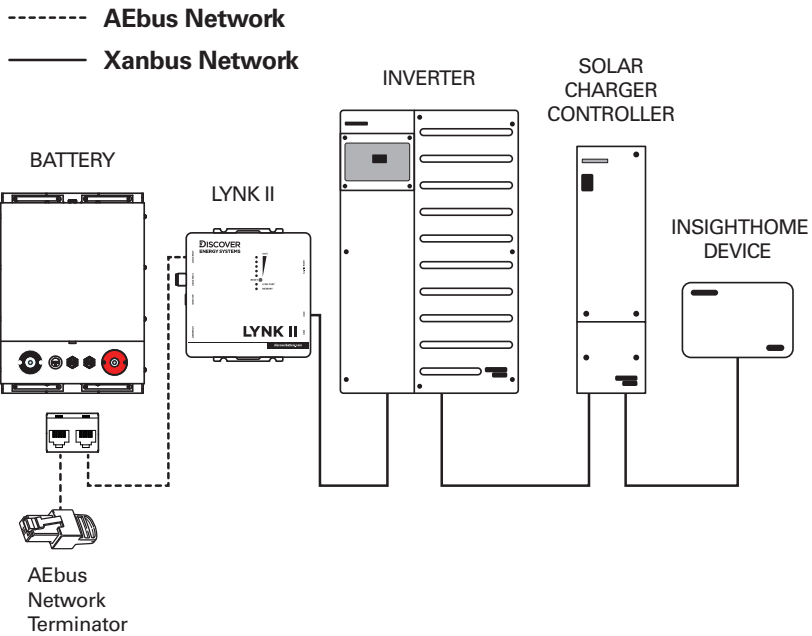
Both LYNK II and AES PROFESSIONAL batteries are internally terminated.

## 5.2 Connecting LYNK II to the Xanbus Network

Insert one end of a CAT5 communication cable into the LYNK II CAN Out port and the other end into a Xanbus port of the Xanbus network.

### NOTICE

- Only one LYNK device can be connected to the Xanbus network simultaneously.
- The LYNK II CAN Out is internally terminated. No other termination is required for LYNK II.



**Figure 6. LYNK II System Overview**

## 6. ENABLING LYNK II TO COMMUNICATE WITH XANBUS DEVICES

When properly connected in a closed-loop network and set to use the Xanbus protocol, the LYNK II communication gateway transmits real-time parameters from the Discover Lithium batteries, including voltage, current, temperature, state of charge, and fault conditions, to the Xanbus network. The LYNK II also transmits Discover Lithium battery charge voltage and current requested by other devices on the Xanbus network, such as inverters and solar charge controllers.

LYNK ACCESS software for Windows 10 64-bit is required to configure LYNK II settings for closed-loop communication with devices on a Xanbus network. InsightHome or InsightFacility with InsightLocal or InsightCloud access is required to configure the Schneider Electric inverter-charger, MPPT Charge Controller, and other Xanbus devices.

Users and installers should be aware that if communication between the LYNK II and the Xanbus network is lost, none of the Xanbus devices will display an error or fault warning. The inverters and MPPT charge controllers on the Xanbus network will continue operating with the last battery temperature and charge set points transmitted by LYNK II. The closed-loop operation of the system will resume if communication is re-established.

Depending on the mode of operation at the communication fault, given enough time, the inverter-charger and MPPT charge controllers will eventually put the attached battery into an overcharged or fully discharged state. When that happens, either situation will trigger the Discover Lithium Battery BMS to self-protect and disconnect the battery from the system.

To restart communication, the user must intervene by reconnecting the battery network to LYNK II and LYNK II to the Xanbus network. If reconnection is unsuccessful, restart the batteries and XW+ inverter, and convert the system to an open-loop configuration before resuming operation.

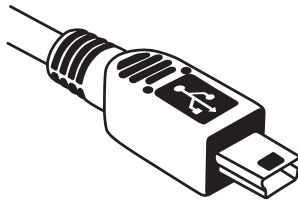
## NOTICE

- If communication between the LYNK II and the Xanbus network is lost for more than ten seconds, inverters and charge controllers on the Xanbus network continue operation with the last battery temperature and charging set points transmitted by LYNK II. Depending on the mode of operation at the time of communication fault, given enough time, the inverter-charger and solar charge-controllers will eventually put the attached battery into an overcharged or fully discharged state. When that occurs, either situation will trigger the Discover Lithium Battery BMS to self-protect and disconnect the battery from the system.
- Discover Lithium batteries and LYNK II do not directly control the inverter's relay functions, generator starting, or other grid-interactive features. These functions are controlled through the programming of the inverter.

## 6.1 Setting the LYNK II Communication Protocol for Xanbus

### The Protocol Configuration Procedure

1. Download the current version of LYNK ACCESS software from the Discover Energy Systems website to obtain the most up-to-date suite of available protocol configurations.
2. Using a USB cable with a Type-B mini plug, connect the Windows 10 64-bit computer running the LYNK ACCESS software to the USB port on LYNK II. Ensure that LYNK II is powered and connected to the correct end of the Xanbus network.



*Figure 7. USB Type-B mini plug*

3. Open LYNK ACCESS. Options for configuration and settings are found by selecting the LYNK tab
4. Connect the LYNK II and open LYNK ACCESS. Ensure that you only have one LYNK device connected to the computer.
5. Open LYNK ACCESS and select the LYNK tab. Select the blue gear icon in the upper right area of the CAN Settings tile.

6. Select the pre-configured Xanbus protocol to complete the closed-loop configuration for LYNK II. Click **SAVE** to confirm the configuration.

## NOTE

Saving configuration changes using LYNK ACCESS automatically causes the LYNK II to shut down and restart.

## 6.2 Verifying the Network Connections

### 6.2.1 Verification of Xanbus Network Connections

Please review the following steps to verify that all batteries communicate over Xanbus.

All networked Discover Lithium batteries will appear as a single battery on InsightLocal.

- Dashboard > Devices > Device Overview

### 6.2.2 Verification of LYNK AEBus Network Connections

Please review the following steps to verify that all batteries communicate over the LYNK AEBus network.

- **Devices > Inverter/Charger > Configuration (Advanced) > Battery Settings**

If the connection was successful, the listed Battery Bank Capacity should be as follows:

Product	AES 7.4 42-48-6650	AES 3.0 44-48-3000	AES RACKMOUNT 48-48-5120	AES PROFESSIONAL DLP-GC2-48V
Capacity	130 Ah x number of batteries	57 Ah x number of batteries	100 Ah x number of batteries	30 Ah x number of batteries

If the connection was unsuccessful, check that termination is correct on the network and for any damage to the network cabling, terminators, and connectors. Confirm all batteries have the same firmware revision. Rectify any problems and verify again.

## NOTE

Discover Lithium batteries are visually represented by a Conext Battery Monitor image when viewed on InsightLocal or InsightCloud.

## 7. XW+ CONFIGURATION SETTINGS - INSIGHTLOCAL

The following settings must be programmed using an InsightHome gateway with InsightLocal software to operate the XW+ in a closed-loop configuration with LYNK II and Discover Lithium batteries. Save any changes to the settings on InsightLocal by clicking the Apply button.

Most of the Battery and Charger Settings cannot be changed by the user and will be automatically overwritten if they are changed. These settings are referred to as Fixed and Dynamic settings. Some settings are user Adjustable and help manage the system's performance to match user preferences.

When using the XW+, the system operates optimally if the battery SOC is utilized as the driving value rather than voltage, especially if the XW+ Grid Support function is enabled.

### Minimum XW+ Setup Required > InsightLocal

- > **Battery Settings**

- Devices > Inverter/Chargers > Configuration (Advanced) > Battery Settings

- > **Charger Settings**

- Devices > Inverter/Charger > Configuration (Advanced) > Charger Settings

**Fixed** values are automatically set by Discover Lithium batteries when connected over Xanbus. Discover Lithium batteries will automatically override any settings that the user adjusts.

**Dynamic** values constantly change under regular operation and cannot be overridden by the user. The values provided are for reference only.

**Adjustable** values are set by the user and defined by the use case and the user's operational preferences. LYNK II does not configure these settings; the values provided are only for reference.

Many factors can influence DC voltage. State of Charge (SOC) is considered more reliable than DC voltage as a trigger value. Therefore, enabling SOC Control is the recommended setup for all XW+ systems.

### NOTE

- User Adjustable Setting changes are not implemented until they are saved. Save changes to User Adjustable Settings by clicking the Apply button.
- Discover Lithium Batteries and LYNK Gateway devices do not use the InsightLocal BMS settings to configure the XW PRO or other devices on the Xanbus Network. (InsightLocal > Devices > Inverter/Chargers > Configuration (Advanced) > BMS Settings).



## 7.1 XW+ Battery Settings

### InsightLocal > Devices > Inverter/Chargers > Configuration (Advanced) > Battery Settings

Battery Settings

Battery Type  Battery Temperature Coefficient  mV/°C

Charge Cycle  Maximum Discharge Current  A

SOC Control Enable  Maximum Discharge Time Interval  s

Battery Bank Capacity  Ah Low Battery Cut Out  V

Maximum Charge Rate  % Low Battery Cut Out Delay  s

Default Battery Temperature  Low Battery Cut out Hysteresis  V

Absorption Time  s High Battery Cut Out  V

Equalize Support  Equalization Allowed Bulk Termination Voltage  V

Equalize Now  Disabled Bulk Termination Time  s

Equalize Voltage Set Point  V Charge Cycle Timeout  min

Bulk/Boost Voltage Set Point  V

Absorption Voltage Set Point  V

**Figure 8. Battery Settings**

InsightLocal > Battery Settings	Type	48 V System Values
Battery Type (Flooded, GEL, AGM, Custom, Li-ion)	Fixed	The battery management system (BMS) will program this to Custom.
Charge Cycle (3 Stage, 2 Stage, External BMS)	Adjustable	The BMS sets this to 2-Stage. (Bulk and Absorption stages)
SOC Control Enable (Enable/Disable)	Adjustable	The BMS sets this to Enable. State of Charge (SOC) is considered more reliable than DC voltage as a trigger value.
Battery Bank Capacity (Ah)	Fixed	The BMS sets this value. The value is determined by the number of batteries on the LYNK or AEBus network. For example, two 42-48-6650 batteries display a value of 260 Ah.
Maximum Charge Rate (%)	Adjustable	This defaults to 100%. If required, use this setting to de-rate the charger output of each device in the system (i.e., This is not a system-wide setting). The maximum charging current delivered by the entire system should not exceed the maximum charge current rating of the entire battery system.

InsightLocal > Battery Settings	Type	48 V System Values
Default Battery Temperature (Hot, Warm, Cold)	Adjustable	When operating in a closed loop, the BMS will communicate the internal battery temperature.  The default is warm. (Ignore the displayed value.)
Absorption Time (Seconds)	Fixed	When operating in a closed loop, the BMS will communicate this value.  XW+ defaults this to 10800 seconds. (Ignore the displayed value.)
Equalize Support (Yes/No)	Fixed	XW+ defaults this to Allowed, but the BMS disables the function. (Ignore the displayed value.)
Equalize Now (Yes/No)	Fixed	This defaults to Disabled. The BMS also disables the function.  This setting will not be visible if Equalized Support is set to No Equalization.
Equalize Voltage Set Point (V)	Fixed	Ignore the displayed value.  When operating in a closed loop, the BMS disables this function.  This setting will not be visible if Equalized Support is set to No Equalization.
Bulk/Boost Voltage Set Point (V)	Dynamic	Ignore the displayed value.  When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.
Absorption Voltage Set Point (V)	Dynamic	Ignore the displayed value.  When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.
Battery Temperature Coefficient (mV/°C)	Adjustable	The recommended setting is 0 mV/°C.  When operating in a closed loop, the battery communicates the actual voltage based on the internal battery temperature.
Maximum Discharge Current (A)	Fixed	When operating in a closed loop, the BMS programs the value.  The displayed value is 130 A for each 42-48-6650, 57 A for each 44-48-3000, 58 A for each DLP-GC2-48V, and 95 A for each 48-48-5120, to a maximum of 140 A, if multiple batteries are used.

<b>InsightLocal &gt; Battery Settings</b>	<b>Type</b>	<b>48 V System Values</b>
Maximum Discharge Time Interval (Seconds)	Fixed	Ignore the displayed value. When operating in a closed loop, the BMS programs the value.
Low Battery Cut Out (V)	Dynamic	Ignore the displayed value. When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary to allow maximum discharge without causing an under-voltage fault.
Low Battery Cut Out Delay (Seconds)	Adjustable	The recommended setting is 10 seconds or less.  Setting the Low Battery Cut Out Delay avoids unnecessary Battery Management System (BMS) safety feature engagement.
Low Battery Cut Out Hysteresis	Dynamic	Ignore the displayed value. When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary.
Low Battery Cut Out Warning Offset	Dynamic	Ignore the displayed value. When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary.
High Battery Cut Out (V)	Fixed	Ignore the displayed value. When operating in a closed loop, the BMS programs the value.
Bulk Termination Voltage (V)	Fixed	Ignore the displayed value. When operating in a closed loop, the BMS programs the value.
Bulk Termination Time (Seconds)	Adjustable	The recommended setting is 1 second.  Refer to the XW+ user documentation for additional user-specified Grid Support settings.
Charge Cycle Timeout (Minutes)	Adjustable	The recommended setting is 480 minutes.

## 7.2 XW+ Charger Settings

### InsightLocal > Devices > Inverter/Chargers > Configuration (Advanced) > Charger Settings

The screenshot shows the 'Charger Settings' window. At the top, there's a title bar 'Charger Settings'. Below it, 'Recharge Voltage' is shown with a slider and a text box containing '51.2' followed by a 'V' unit. To the right, 'Charge Block Start' is set to '12:00 AM' using a digital time picker. Below that, 'Charge Block Stop' is also set to '12:00 AM'. At the bottom right, there are two buttons: 'Apply' and 'Reset'.

Figure 9. Charger Settings

InsightLocal > Charger Settings	Type	48 V System Values
ReCharge Voltage (V)	Adjustable	Not Recommended. Enabling SOC Control will disable ReCharge Volts (Ignore any value displayed).
Charge Block Start	Adjustable	Specify the start time when AC charging is blocked. Charge block specifies when charging from AC (grid) is blocked.
Charge Block Stop	Adjustable	Specify the end time when AC charging is blocked. Charge block specifies when charging from AC (grid) is blocked.

## 8. MPPT SOLAR CHARGE CONTROLLER CONFIGURATION SETTINGS - INSIGHTLOCAL

Set the following settings in InsightLocal to configure the MPPT Solar Charge Controller to operate in a closed-loop configuration with Discover Lithium batteries over Xanbus.

Most of the Battery Settings cannot be changed by the user and will be automatically overwritten if they are changed. However, with the XW+ present, the entire system will operate optimally if the battery State of Charge is utilized as the driving value rather than voltage, especially if the Grid Support function is enabled.

### Minimum MPPT Setup Required Using InsightLocal

- **Charger Settings**
  - Devices > MPPT Charge Controller > Configuration (Advanced) > Charger Settings
- **Battery Settings**
  - Devices > MPPT Charge Controller > Configuration (Advanced) > Battery Settings

**Fixed** values are automatically set by Discover Lithium batteries when connected over Xanbus. Discover Lithium batteries will automatically override any settings that the user adjusts.

**Dynamic** values constantly change under regular operation and cannot be overridden by the user. The values provided are for reference only.

**Adjustable** values are set by the user and defined by the use case and the user’s operational preferences. LYNK II does not configure these settings; the values provided are only for reference.

Many factors can influence DC voltage. State of Charge (SOC) is considered more reliable than DC voltage as a trigger value. Therefore, enabling SOC Control is the recommended setup for all XW+ systems.

## 8.1 MPPT Solar Charge Controllers - Charger Settings

### InsightLocal > Devices > MPPT Charge Controller > Configuration (Advanced) > Charger Settings

The screenshot shows the 'Charger Settings' configuration page. It contains the following settings:

- Equalize Voltage Set Point:** 64 V (slider)
- Equalize Support:** Equalization Not Allowed (toggle)
- Bulk/Boost Voltage Set Point:** 56.72 V (slider)
- Float Voltage Set Point:** 53.6 V (slider)
- Recharge Voltage:** 50 V (slider)
- Absorption voltage Set Point:** 56.72 V (slider)
- Absorption Time:** 180 min (slider)
- Charge Cycle:** 3 Stage (dropdown)
- Maximum Charge Rate:** 100 % (slider)
- Equalize Now:** Disabled (toggle)
- Charge Mode:** Primary (dropdown)
- Default Battery Temperature:** Warm (dropdown)

Buttons for 'Apply' and 'Reset' are located at the bottom right.

**Figure 10. Charger Settings**

InsightLocal > Charger Settings	Type	48 V System Values
Equalize Voltage Set Point (V)	Fixed	Ignore the displayed value. The BMS disables this function. Note: A Lithium battery should never be equalized.
Equalize Support (Yes/No)	Fixed	Ignore the displayed value. The BMS disables this function. Note: A Lithium battery should never be equalized.
Bulk/Boost Voltage Set Point (V)	Dynamic	Ignore the displayed value. When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.

<b>InsightLocal &gt; Charger Settings</b>	<b>Type</b>	<b>48 V System Values</b>
Float Voltage Set Point (V)	Dynamic	Ignore the displayed value. When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.
Recharge Voltage (V)	Adjustable	When the Charge Cycle is set to 3-Stage, ReCharge Voltage will be Disabled (Ignore any value displayed).
Absorption Voltage Set Point (V)	Dynamic	Ignore the displayed value. When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.
Absorption Time (Minutes)	Adjustable	The recommended setting is 180 minutes.
Charge Cycle (3 Stage, 2 Stage)	Adjustable	Set to 3-stage to provide current for parasitic loads.
Maximum Charge Rate (%)	Adjustable	This defaults to 100%. If required, use this setting to de-rate the charger output of each device in the system (i.e., This is not a system-wide setting). The maximum charging current delivered by the entire system should not exceed the maximum charge current rating of the entire battery system.
Equalize Now (Yes/ No)	Fixed	This defaults to Disabled. The BMS also disables the function. This setting will not be visible if Equalized Support is set to No Equalization. Note: a Lithium battery should never be equalized.
Charge Mode (Stand-alone, Primary, Secondary, Echo)	Adjustable	The recommended setting is Primary, which sets PV charging as the primary DC charging source when available.
Default Battery Temperature (Hot, Warm, Cold)	Adjustable	When operating in a closed loop, the BMS will communicate the internal battery temperature. The default is warm. (Ignore the displayed value.)

## 8.2 MPPT Solar Charge Controllers - Battery Settings

InsightLocal > Devices > MPPT Charge Controller > Configuration (Advanced)  
 > Battery Settings

Battery Settings

Battery Type ? Custom

Nominal Battery Voltage ? 48

Battery Bank Capacity ? 260 Ah

Battery Temperature Coefficient ? 0 mV/°C

Apply Reset

Figure 11. Battery Settings

InsightLocal > Battery Settings	Type	48V System Values
Battery Type (Flooded, GEL, AGM, Custom)	Adjustable	Set the value to Custom.  Other values conflict with the Battery Type used by the inverter-charger.
Nominal Battery Voltage (24 V / 48 V)	Adjustable	Set the value to 48 V.  Other values conflict with the Nominal Battery Voltage and the value used by the XW+.
Battery Bank Capacity (Ah)	Adjustable	This value must be set to the number of batteries in the system multiplied by the rated capacity of the Discover Lithium battery.  The battery model determines the capacity value: 130 A for a single 42-48-6650, 57 A for a single 44-48-3000, 30 A for a single DLP-GC2-48V, and 95 A for a single 48-48-5120.
Battery Temperature Coefficient (mV/°C)	Adjustable	The recommended setting is 0 mV/°C.  When operating in a closed loop, the battery communicates the actual voltage based on the internal battery temperature.