

LYNK II

(950-0025)

USER MANUAL SCHNEIDER XW PRO WITH INSIGHTHOME (XANBUS)

Introduction	3
1.0 AUDIENCE, WARNINGS, MESSAGES, GENERAL SAFETY, PERSONAL PROTECTIVE EQUIPMENT	3
1.1 Audience.....	3
1.2 Warning, Caution, Notice and Note Messages.....	3
1.3 General Warnings	4
1.4 Safe Handling Procedures.....	4
1.5 Personal Protective Equipment.....	5
2.0 DOCUMENTATION	5
3.0 OVERVIEW	6
3.1 System Overview	6
3.2 Compatible Batteries and Devices	7
3.3 Minimum Battery System Capacity	8
4.0 LYNK II CAN HARDWARE TERMINATION AND CAN OUT PIN CONFIGURATION.....	9
4.1 LYNK II CAN Termination	9
4.2 LYNK II CAN Out - RJ45 Pin Assignments for Xanbus Inverters.....	9
4.2.1 Xanbus Pin Assignments	10
5.0 INSTALLING AND CONNECTING LYNK II TO THE XANBUS NETWORK.....	11
5.1 Networking Discover Lithium Batteries with LYNK II	11
5.2 Connecting LYNK II to the Xanbus Network	13
6.0 ENABLING LYNK II TO COMMUNICATE WITH XANBUS DEVICES	13
6.1 Setting the LYNK II Communication Protocol for Xanbus.....	14
6.2 Verifying the Xanbus Connection	15
6.2.1 Verification of Xanbus Network Connections.....	15
6.2.2 Verification of AEBus Network Connections.....	16
7.0 XW PRO CONFIGURATION SETTINGS - INSIGHTLOCAL	16
7.1 XW PRO - Battery Settings.....	17
7.2 XW PRO - Charger Settings.....	20
8.0 MPPT SOLAR CHARGE CONTROLLER CONFIGURATION SETTINGS - INSIGHTLOCAL	21
8.1 MPPT Solar Charge Controllers - Charger Settings	22
8.2 MPPT Solar Charge Controllers - Battery Settings.....	24

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.

1.0 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.

WARNING

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

WARNING

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

NOTICE

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

NOTE

Ad hoc information concerning essential 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

- 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, 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, attempt to insert foreign objects into the battery, immerse or expose it to water or other liquids, fire, explosion, or other hazards.
- 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. Using 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 with only another one that meets the system's specifications. 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.

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.

2.0 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 solar.se.com for the most recent version of published documents.

Discover Energy Systems Documentation

Visit discoverlithium.com for the most recent version of published documents, including Discover Lithium battery user manuals and the LYNK II Communication Gateway User Manual (805-0033).

3.0 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 battery communication network to either the LYNK Port or AEBus Port, and then connect the CAN Out Port to the power conversion equipment's communication network.
- Ensure all networks are correctly terminated.
- Set the LYNK II Gateway using LYNK ACCESS software to the correct protocol to enable closed-loop communication between the Discover batteries and the power conversion equipment.
- Enable the desired use case and set up user preferences using the power conversion control system.

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 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.

Discover Lithium battery charge and discharge settings in an open-loop configuration are set up manually through the controller for the power conversion device at the time of installation. An open-loop configuration is commonly referred to as a 'lead-acid drop-in' replacement configuration.

In a closed-loop configuration, the BMS of the Discover Lithium battery sends 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 charger output and deliver other functional controls based on battery voltage, temperature and percent State-of-Charge.

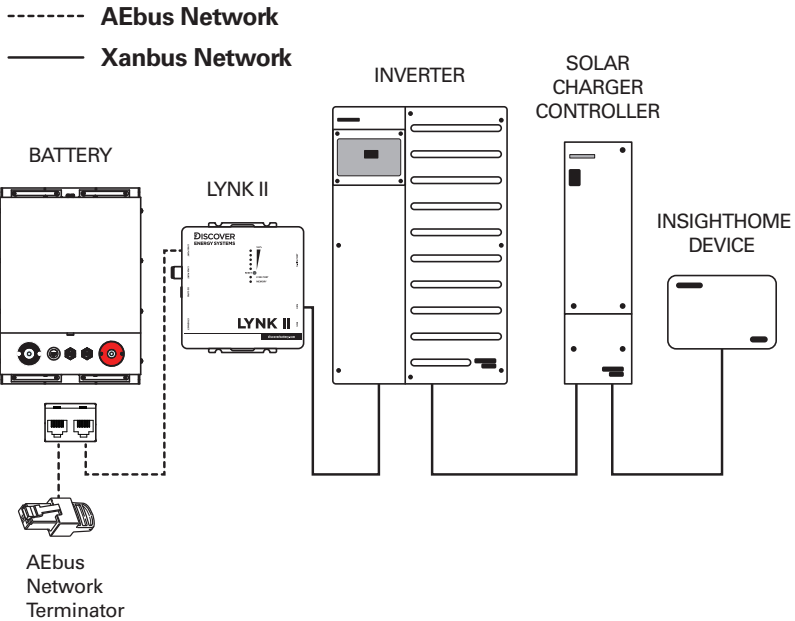


Figure 1. LYNK II System Overview

3.2 Compatible Batteries and Devices

LYNK II Communication Gateway is compatible with the following **Schneider Electric Devices**:

- XW PRO: 6848 NA 120/240 / 6848 NA 120 / 8548 IEC 230
- MPPT 60-150
- MPPT 80-600
- MPPT 100-600
- InsightHome / InsightFacility

Discover Lithium Batteries

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

- AES LiFePO₄: 42-48-3000, 42-48-6650
- AES PROFESSIONAL: DLP-GC2-48V
- AES RACKMOUNT: 48-48-5120, 48-48-5120H

NOTICE

Conext Battery Monitor is incompatible with the LYNK II Communication Gateway and must not be used on the same Xanbus network.

3.3 Minimum Battery System Capacity

The Discover Lithium Battery and the Schneider XW PRO manage battery charge and discharge rates automatically. Using large solar arrays with battery banks that are too small can exceed the operating limits of the battery and possibly lead to the BMS triggering over-current protection. Battery capacity must accept the maximum charge current of the system, or charging must be curtailed 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.

$$\text{Inverter Peak Value} = (\text{Inverter Surge Value}) / (\text{Inverter Efficiency}) / (48\text{V: Low Battery Cut-Off})$$

Model	Inverter Peak Amps DC (Seconds)	Discharge Continuous Max Amps DC	Charger Continuous Max Amps DC	AES 7.4 42-48-6650 Minimum per inverter ⁽⁴⁾	AES 3.0 44-48-3000 Minimum per inverter ⁽⁵⁾	AES RACKMOUNT 48-48-5120 Minimum per inverter ⁽⁶⁾	AES PROFESSIONAL DLP-GC2-48V Minimum per inverter ⁽⁷⁾
XW PRO 6848 NA 120/240	276 (60) ⁽¹⁾	180	140	2	4	2	5
XW PRO 6848 NA 120	278 (60) ⁽²⁾	180	120	2	4	2	5
XW PRO 8548 IEC 230	267 (60) ⁽³⁾	180	140	2	4	2	5

(1) Calculated based on max 180 A DC input, 52 A at 240 VAC 60-second output, efficiency 94.1% (CEC), and 140 A DC charger, as published in Schneider Electric data sheets (2022-06).

(2) Calculated based on 180 A DC input, 104 A at 120 VAC 60-second output, efficiency 93.6% (CEC), and 120 A DC charger, as published in Schneider Electric data sheets (2022-06).

(3) Calculated based on max 180 A DC input, 53 A at 230 VAC 60-second output, efficiency 95% (Peak), and 140 A DC charger, as published in Schneider Electric data sheets (2022-06).

(4) 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).

(5) 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).

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

(7) Discover DLP-GC2-48V Battery, Peak Power: 90 A DC (3 seconds), Max Charge (1Hr): 29 A DC, MAX Discharge (1Hr): 58 A DC, as published in Discover DLP-GC2-48V User Manual (2023-08).

4.0 LYNK II CAN HARDWARE TERMINATION AND CAN OUT PIN CONFIGURATION

4.1 LYNK II CAN Termination

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

Jumpers are used to configure termination for AEBus and LYNK Network and the CAN Out Pin assignments. Follow the LYNK II Communication Gateway User Manual (805-0033) to learn how to access and configure the header board with jumpers.

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

NOTE
LYNK II terminates the AEBus and LYNK Network by default. Do not remove the termination jumper inside LYNK II unless instructed to do so 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

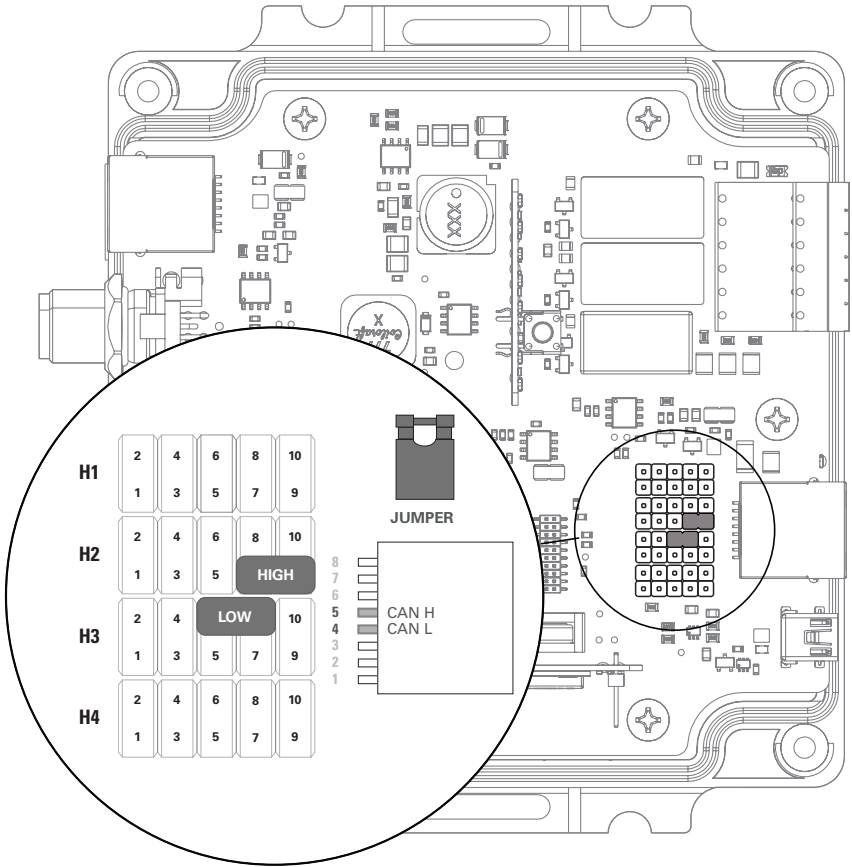


Figure 2. Schneider Electric Pin Assignments

5.0 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 RJ45 network cable or 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 Network with other networks may result in equipment malfunction and damage.
- Unless Discover Energy Systems specifies, power electronics must not be connected directly to the LYNK or AEBus network.

Refer to the [LYNK II Communication Gateway User Manual \(805-0033\)](#) for detailed instructions on network layouts, connections and terminations for compatible Discover Lithium battery models. Some key reminders are provided in this manual.

- At least one battery must be connected to the LYNK Port or AEBus Port on LYNK II.
- 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's proper functioning - note some batteries and devices may auto-terminate.
- LYNK II requires power. There are three possible sources: a 13-90 VDC power supply, AEBus Port, or LYNK Port enabled Discover Lithium batteries or a USB device.
- Discover Lithium batteries must be set to ON to supply power and communicate data with LYNK II.

AES LiFePO₄ batteries are not internally terminated. LYNK II is internally terminated. When using LYNK II with an AEBus network, ensure a terminator is installed at the far end of the battery network opposite LYNK II.

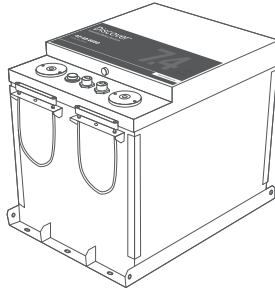


Figure 3. AES LiFePO₄ Battery

NOTE

AES LiFePO₄ 48V 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 LiFePO₄ batteries listed below.

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

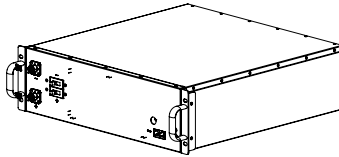


Figure 4. AES RACKMOUNT Battery Module

Both LYNK II and AES RACKMOUNT battery modules are internally terminated.

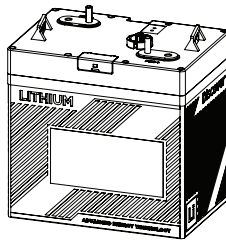


Figure 5. AES PROFESSIONAL Battery

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 into a Xanbus port of the Xanbus network.

NOTICE	
<ul style="list-style-type: none">• Only one LYNK Gateway device can be connected to the Xanbus network.• The LYNK II CAN Out is internally terminated. No other termination is required for LYNK II.	

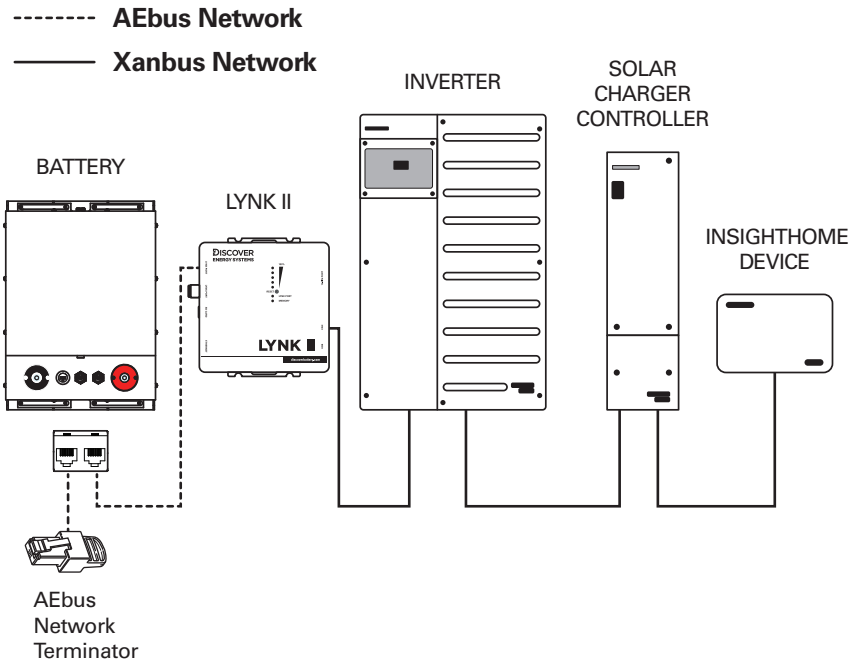


Figure 6. LYNK II System Overview

6.0 ENABLING LYNK II TO COMMUNICATE WITH XANBUS DEVICES

When properly connected to a closed-loop network and set to use the Xanbus protocol, LYNK II will transmit real-time parameters from the Discover Lithium battery, including voltage, current, temperature, state of charge, and fault conditions to the Xanbus network. LYNK II will also transmit charge voltage and current requests from the Discover Lithium battery to devices on the Xanbus network, such as inverters and solar charge controllers.

LYNK ACCESS software for 64-bit Windows 10 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 Controllers, and other Xanbus devices.

Users and installers should be aware that if communication between 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 time of communication fault and 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 occurs, 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, the batteries and XW PRO inverter should be restarted, and the system converted 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 will 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 and 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.

NOTICE

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.

- 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. Ensure LYNK II is powered and connected to the correct end of the Xanbus network.

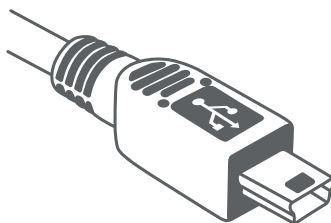


Figure 7. USB Type-B mini-plug

- Connect the LYNK II and open LYNK ACCESS.
Ensure that you only have one LYNK device connected to the computer.
Options for configuration and settings are found by selecting the LYNK tab.
- Select the LYNK tab. Select the blue gear icon in the upper right area of the CAN Settings tile.
- 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 will automatically cause LYNK II to shut down and restart.

6.2 Verifying the Xanbus Connection

6.2.1 Verification of Xanbus Network Connections

Review the following steps to verify that all batteries are communicating over Xanbus.

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

- Dashboard > Devices > Device Overview

6.2.2 Verification of AEBus Network Connections

Review the following steps to verify that all batteries communicate over AEBus.

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

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

Battery Settings	AES 7.4 42-48-6650	AES 3.0 44-48-3000	AES RACKMOUNT 48-48-5120	AES PROFESSIONAL DLP-GC2-48V
Battery Bank 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 is unsuccessful, check if the network is correctly terminated 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 AES LiFePO₄, AES RACKMOUNT, and AES PROFESSIONAL batteries will be visually represented by a Conext Battery Monitor image on InsightLocal or InsightCloud.

7.0 XW PRO CONFIGURATION SETTINGS - INSIGHTLOCAL

The following settings must be programmed using an InsightHome gateway with InsightLocal software to operate XW PRO in a closed-loop configuration with LYNK II and Discover Lithium batteries. Ensure that settings on InsightLocal are saved by clicking on the Save Changes 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 PRO, the system operates optimally if the battery SOC is utilized as the driving value rather than voltage, especially if the XW PRO Grid Support function is enabled.

Minimum XW PRO 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 PRO systems.

NOTE

- User Adjustable Setting changes are not implemented until they are saved. Ensure that updates to User Adjustable Settings are saved by clicking the Save Changes 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 PRO - Battery Settings

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

Battery Settings

<p>Battery Type ? <input type="text" value="Custom"/></p> <p>Charge Cycle ? <input type="text" value="2 Stage"/></p> <p>SOC Control Enable ? <input checked="" type="checkbox"/> Enabled</p> <p>Battery Bank Capacity ? <input type="text" value="130"/> Ah</p> <p>Maximum Charge Rate ? <input type="text" value="100"/> %</p> <p>Default Battery Temperature ? <input type="text" value="Warm"/></p> <p>Absorption Time ? <input type="text" value="10800"/> s</p> <p>Equalize Support ? <input checked="" type="checkbox"/> Equalization Allowed</p> <p>Equalize Now ? <input type="checkbox"/> Disabled</p> <p>Equalize Voltage Set Point ? <input type="text" value="64"/> V</p> <p>Bulk/Boost Voltage Set Point ? <input type="text" value="55.96"/> V</p> <p>Absorption Voltage Set Point ? <input type="text" value="55.96"/> V</p>	<p>Battery Temperature Coefficient ? <input type="text" value="0"/> mV/°C</p> <p>Maximum Discharge Current ? <input type="text" value="256"/> A</p> <p>Maximum Discharge Time Interval ? <input type="text" value="5"/> s</p> <p>Low Battery Cut Out ? <input type="text" value="43.2"/> V</p> <p>Low Battery Cut Out Delay ? <input type="text" value="4"/> s</p> <p>Low Battery Cut out Hysteresis ? <input type="text" value="8.32"/> V</p> <p>High Battery Cut Out ? <input type="text" value="58.4"/> V</p> <p>Bulk Termination Time ? <input type="text" value="1"/> s</p> <p>Charge Cycle Timeout ? <input type="text" value="480"/> min</p> <p>High SOC Cut Out ? <input type="text" value="100"/> %</p> <p>High SOC Cut Out Delay ? <input type="text" value="60"/> s</p> <p>Low SOC Cut Out ? <input type="text" value="10"/> %</p> <p>Low SOC Cut Out Delay ? <input type="text" value="60"/> s</p>
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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) programs this as Custom.
Charge Cycle (3 Stage, 2 Stage, External BMS)	Adjustable	Set to 2-Stage (Bulk and Absorption stages).
SOC Control (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 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 setting 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 charge current delivered by the entire system should not exceed the maximum charge current rating of the entire battery system.
Default Battery Temperature (Hot, Warm, Cold)	Adjustable	When operating in a closed loop, the BMS communicates the internal battery temperature. The default value is Warm. (Ignore the displayed value.)
Absorption Time (Seconds)	Fixed	When operating in a closed loop, the BMS communicates this value. The XW PRO defaults this setting to 10800 seconds. (Ignore the displayed value.)
Equalized Support (Yes/No)	Fixed	This setting defaults to Allowed on the XW PRO, but the BMS disables the function. (Ignore the displayed value.)
Equalize Now (Yes/No)	Fixed	This setting defaults to Disabled. The BMS also disables the function. This setting is hidden if Equalized Support is set to No equalization.
Equalization Voltage Set Point (V)	Fixed	Ignore the displayed value. When operating in a closed loop, the BMS disables this function. This setting is hidden 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.

InsightLocal > Battery Settings	Type	48 V System Values
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.
Float Voltage Set Point (V)	Fixed	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, 30 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.
Maximum Discharge Time Interval (Seconds)	Fixed	Ignore the displayed value. When operating in a closed loop, the BMS programs the value.
Low Batt Cut Out (V)	Dynamic	Ignore the displayed value. When operating in a closed loop, the BMS communicates this value, and the displayed value will vary to allow maximum discharge without causing an under-voltage fault.
Low Batt Cut Out Delay (Seconds)	Adjustable	The recommended setting is 10 seconds or less. Setting the Low Batt Cut Out Delay avoids unnecessary engagement of the BMS safety features.
Low Battery Cut-Out Hyst	Dynamic	Ignore the displayed value. When operating in a closed loop, the BMS communicates this value, and the displayed value varies.
High Batt Cut Out (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. See XW PRO user documentation for additional user-specified Grid Support settings.
Charge Cycle Timeout (Minutes)	Adjustable	The recommended setting is 480 minutes.

InsightLocal > Battery Settings	Type	48V System Values
High SOC Cut Out (%)	Adjustable	The recommended setting is 99%. Setting the High Battery Cut Out delay avoids unnecessary engagement of the BMS safety features.
High SOC Cut Out Delay (Seconds)	Adjustable	The recommended setting is 60 seconds. Setting the High SOC Cut Out delay avoids unnecessary engagement of the BMS safety features.
Low SOC Cut Out (%)	Adjustable	The recommended setting is 25%. The battery can be discharged to 100% Depth of Discharge but must immediately be recharged, or else cell damage can occur. An over-discharged battery may not be able to accept a charge and may not be recoverable.
Low SOC Cut Out Delay (Seconds)	Adjustable	The recommended setting is 60 seconds. Setting the Low SOC Cut Out Delay avoids unnecessary engagement of the BMS safety features.

7.2 XW PRO - Charger Settings

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

Charger Settings

Recharge Voltage 50 V

Recharge SOC 50 %

Recharge SOC Delay 50 s

Charge Block Start 12 : 00 AM

Charge Block Stop 12 : 00 AM

Apply Reset

Figure 9. Charger Settings

InsightLocal > Charger Settings	Type	48V System Values
Recharge Voltage (V)	Adjustable	Not Recommended. Enabling SOC Control will disable ReCharge Volts (Ignore any value displayed.)
Recharge SOC (%)	Adjustable	Set SOC higher to keep more energy in reserve for backup needs. Set SOC lower to enable a higher level of self-consumption.
Recharge SOC Delay (seconds)	Adjustable	Setting ReCharge SOC Delay higher delays the start.
Charge Block Start Charge Block End	Adjustable	Specify the start time and end time of when to block AC charging. Charge block specifies when to block charging on AC (grid).

8.0 MPPT SOLAR CHARGE CONTROLLER CONFIGURATION SETTINGS - INSIGHTLOCAL

The following settings must be programmed using InsightLocal to configure the MPPT Solar Charger 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 PRO 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 PRO systems.

8.1 MPPT Solar Charge Controllers - Charger Settings

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

Figure 10. Charger Settings

InsightLocal > CHG	Type	48 V System Values
Equalization Voltage Set Point (V)	Fixed	Ignore the displayed value. The BMS disables this function. NOTE: A Lithium battery should never be equalized.
Equalized 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.
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	Not Recommended. Enabling SOC Control will disable ReCharge Volts (Ignore the displayed value.)
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 setting 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 setting defaults to Disabled. The BMS also disables the function. This setting is not visible if Equalized Support is set to No Equalization.
Charge Mode (Stand-alone, Primary, Secondary, Echo)	Adjustable	The recommended value is Primary. This will set PV charging as the priority DC charging source, when available.
Default Battery Temperature (Hot, Warm, Cold)	Adjustable	When operating in a closed loop, the BMS communicates 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	Type	48 V 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 value used by the inverter-charger.
Battery 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 each 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.