



DISCOVER ENERGY SYSTEMS LYNK II Communication Gateway User Manual

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DISCOVER ENERGY SYSTEMS LYNK II Communication Gateway



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 BMS-enabled inverter-chargers, solar charge controllers, and other devices.

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

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
- Analyzation and reduction of hazards involved in performing electrical work
- Installation and configuration of batteries
- Installation and configuration of systems activated by relays

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.

- **CAUTION**

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

- **NOTICE**

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

- **NOTE**

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

General Warnings

WARNING

ELECTRIC SHOCK AND FIRE HAZARD

- A lithium battery must 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.

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, 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 has been qualified for the system. 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.
- 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.

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.

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 BMS-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 Installation and Operation Manual (805-0033).

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.
- Mount the LYNK II Gateway, and connect the Discover battery communication network to the LYNK Port or

AEBus Port.

- Connect the LYNK II Phoenix connector CAN pins to the InsightHome/InsightFacility CAN pins.
- Ensure all networks are correctly terminated.
- Set the LYNK II Gateway to the correct protocol using LYNK ACCESS software 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.

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 installation time. 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.

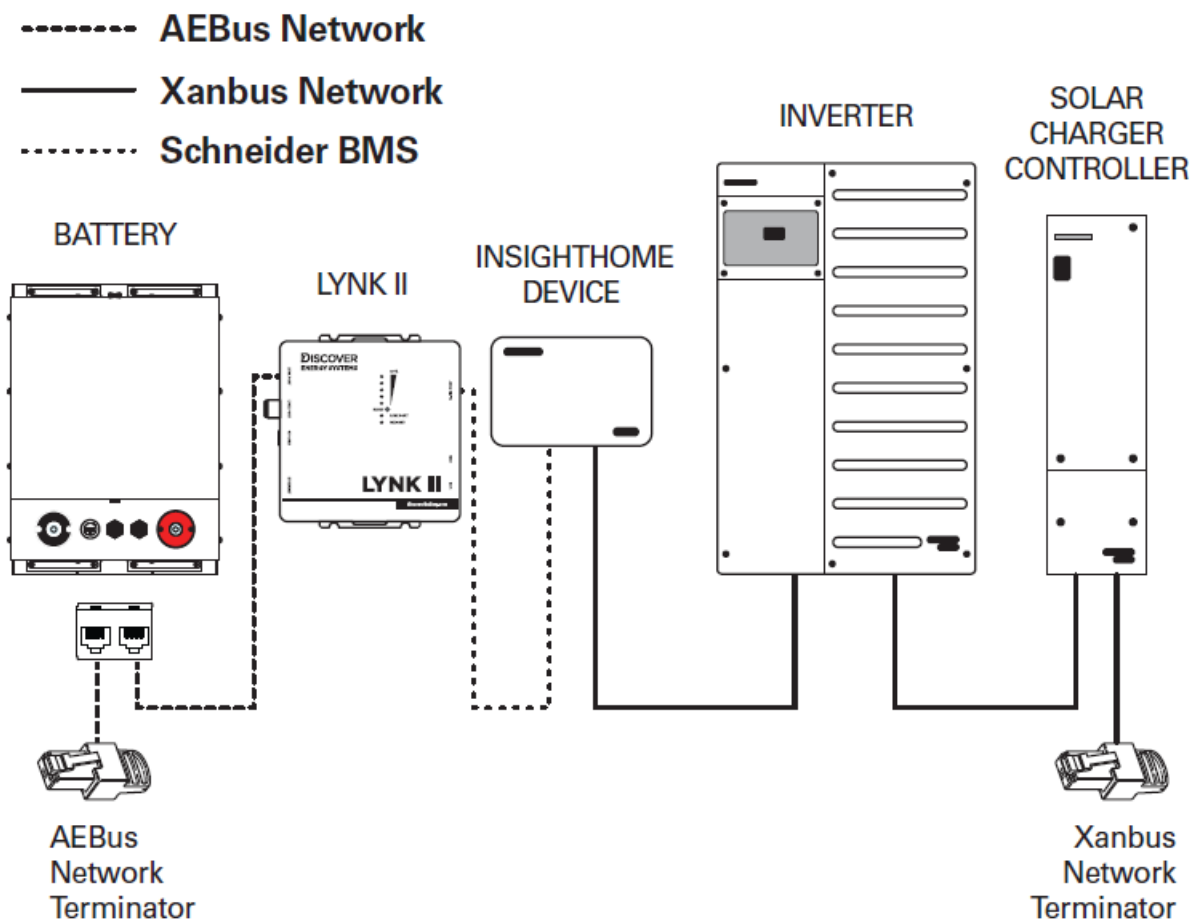


Figure 1. LYNK II System Overview

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, for communicating with a LYNK II device.

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

NOTICE

Schneider Electric XW and Xantrex XW series power conversion devices do not support closed-loop network communication with Discover Lithium batteries.

Minimum Battery System Capacity

The Discover Lithium Battery and the Schneider XW PRO 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 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.

Inverter Peak value = (Inverter Surge Value)/(Inverter Efficiency)/(48V: 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 RACK MOUNT 48-48-5120 Minimum per inverter(6)	AES PROFESSIONAL 48-48-5120 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), 95A 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 (1 hour): 29 A DC, Max Discharge (1 hour): 58 A DC, as published in Discover DLP-GC2-48V User Manual (2023/08).

INSTALLING AND CONNECTING LYNK II TO THE CAN NETWORK

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.

NOTICE

Unless Discover Energy Systems specifies, power electronics must not be connected directly to the LYNK or AEBus network.

Refer to the LYNK II Installation and Operation Manual (805-0033) for detailed instructions on network layouts, connections, and terminations for compatible Discover Lithium battery models. LYNK II is internally terminated.

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.
- No more than one network of batteries may be connected to 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 battery, 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. 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.

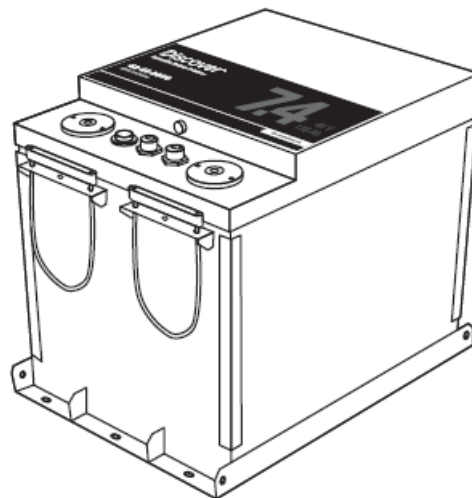


Figure 2. AES LiFePO₄ Battery

NOTE

AES LiFePO₄ 48 V 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

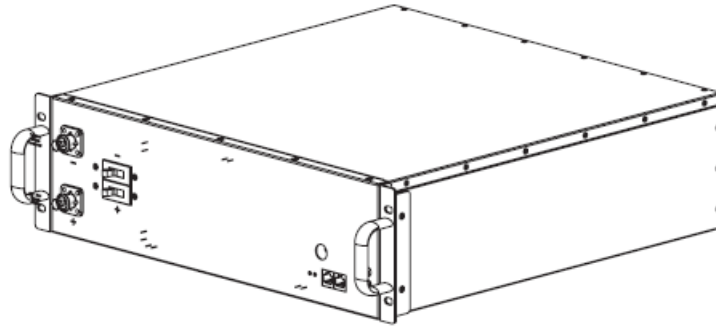


Figure 3. AES RACKMOUNT Battery Module

Both LYNK II and AES RACKMOUNT Battery Modules are internally terminated.

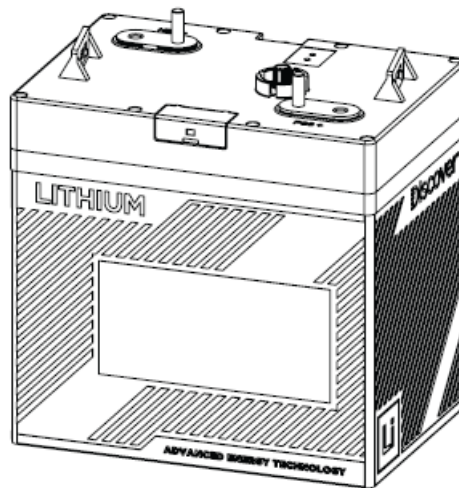


Figure 4. AES PROFESSIONAL

Both LYNK II and AES PROFESSIONAL batteries are internally terminated.

Connecting LYNK II to the Schneider Electric Insight Device

There are multiple ways to communicate between Discover Lithium batteries and Schneider Electric power conversion devices. This document describes a connection that uses the Schneider BMS protocol to connect multiple Discover Lithium batteries to Schneider Electric power conversion devices.

20 AWG wires are recommended to connect the CAN pins on the 12-pin connector of the LYNK II to the CAN pins of either the 12-pin connector of InsightHome or the 26-pin connector of InsightFacility.

LYNK II		Insight Home		Insight Facility	
		12-pin		26 pin	
12	11	2	1	2	1
10	9	4	3	4	3
8	7	6	5	6	5
6	⑤ CAN Ground	⑧	7	⑩	9
4	③ CAN Low	⑩	9	⑫	11
2	① CAN High	⑫	11	⑭	13
				16	15
				18	17
				20	19
				22	21
				24	23
				26	25

Figure 5. Mapping LYNK II Pins to Insight Device Pins

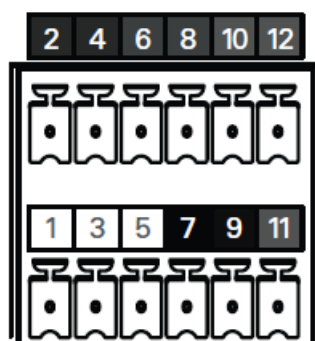


Figure 6. Pin Assignments for Phoenix 12-pin Connector

12-Pin Connector Layout					
2	4	6	8	10	12
RELAY 3 COM	RELAY 3 N/O	RELAY 2 N/O	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 (13-9 0V)	RELAY 1 N/C

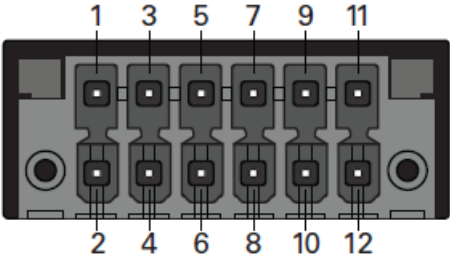
	Top Row			Bottom Row
1	Digital Output (0-4 0 VDC)		2	Digital input 1 (12 VDC)
3	GND		4	Digital input 2 (12 VDC)
5	Do Not Connect		6	Do Not Connect
7	GND ISO		8	GND ISO
9	RS485 A ISO		10	CAN L ISO
11	RS485 B ISO		12	CAN H ISO

Figure 7. InsightHome 12-pin connector

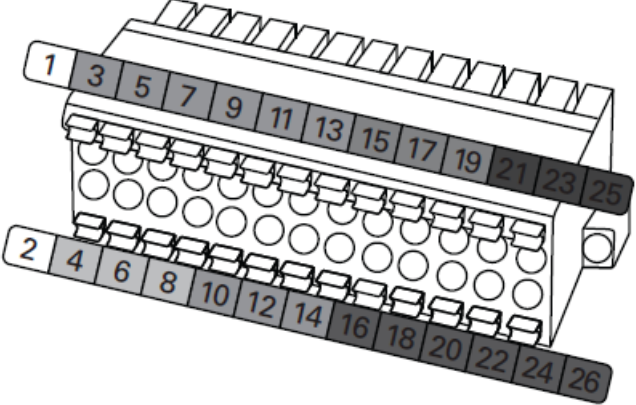
Bottom Row			Top Row	
2	9-24 VDC power input		1	GND
4	GND		3*	0-10 VDC analog input 1
6*	12 VDC digital input 1		5	0-10 VDC analog input 2
8*	12 VDC digital input 2		7	GND
10	ISO1 CAN GND		9*	4-20 mA input 1
12	ISO1 CAN L		11*	4-20 mA input 2
14	ISO1 CAN H		13	GND
16	ISO2 RS485 GN D		15*	Relay 1 NO
18	ISO2 RS485 1A		17*	Relay 1 COM
20	ISO2 RS485 1B		19*	Relay 1 NC
22	ISO2 RS485 GN D		21*	Relay 2 NO
24	ISO2 RS485 2A		23*	Relay 2 COM
26	ISO2 RS485 2B		25*	Relay 2 NC

Figure 8. InsightFacility 26-pin connector

NOTICE

- Connect no more than one LYNK II Communication Gateway device to the CAN network.
- The LYNK II CAN Out is internally terminated. No other termination is required for LYNK II.

ENABLING COMMUNICATION BETWEEN THE LYNK II AND SCHNEIDER ELECTRIC DEVICES

When properly connected in a closed-loop network and set to use the Schneider BMS protocol, LYNK II will transmit real-time parameters from Discover Lithium batteries, including voltage, current, temperature, state of charge, and fault conditions to the Schneider BMS communication device, which then shares that information with other devices on the network, such as XW PRO and MPPT solar charge controllers. LYNK II also transmits charge voltage and current requests from Discover Lithium batteries to the devices on the network.

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

If communication between the LYNK II and the XW PRO is lost, it will display either a Fault or a Warning.

FAULT

- When the Schneider Electric communication is to fault, the XW PRO will go offline.
- The MPPT Solar Charge Controllers will continue to operate in the Last State before communication was lost. The closed-loop operation of the system will resume if communication is re-established.

WARNING

- When the Schneider Electric communication is set up to display a warning, the XW PRO will continue operating with the measured battery voltage and the Comms Lost Battery set points specified with InsightHome or InsightFacility.
- The MPPT Solar Charge Controllers will continue to operate in the Last State before communication was lost. The closed-loop operation of the system will resume if communication is re-established.

To restart communication, the user must intervene by reconnecting the battery network to LYNK II and LYNK II to the Schneider Electric network. If reconnection is unsuccessful, the batteries and the XW PRO inverter should be restarted, and the system should be converted to an open-loop configuration before resuming operation.

NOTICE

- The Discover Lithium Battery BMS will self-protect and disconnect the battery from the system if Over-Voltage, Under-Voltage, Over-temp, Over-Charge, or other situations occur. See Discover Energy Systems Manual for more information.
- 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.

Setting the LYNK II Communication Protocol

1. Download the latest version of LYNK ACCESS software from the Discover Energy Systems website to obtain the most up-to-date suite of available protocol configurations (LYNK ACCESS 1.2.0 or later includes the Schneider BMS protocol).
2. Connect a USB cable with a mini-B plug to the USB port on the LYNK II and the Type-A plug to the 64-bit Windows 10 device running LYNK ACCESS software. Confirm the LYNK II is powered and connected correctly to the Schneider Electric Insight device. Ensure that there is only one LYNK device connected to the computer.

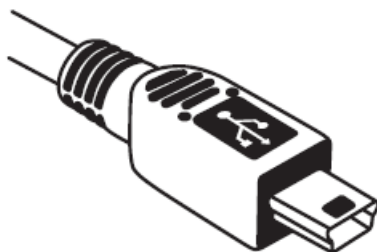


Figure 9. USB Type-B mini plug

3. Open LYNK ACCESS. Options for configuration and settings are found by selecting the LYNK tab.
4. From the LYNK tab, select the blue gear icon in the upper right area of the CAN Settings tile.
5. From the Closed Loop Protocol list, select Schneider BMS.
6. Click SAVE to confirm the configuration.
7. NOTE

Saving configuration changes using LYNK ACCESS will automatically cause LYNK II to shut down and restart.

Setting up the Insight Device

Updating Schneider Device Firmware

Ensure that all devices have up-to-date firmware.

1. Update the firmware of the InsightHome or InsightFacility.
 - Setup > Configuration
 - From Firmware Upgrade, click Upload Package and install the latest firmware file.
2. Update the firmware of the XW PRO.
 - Devices > Inverter/Chargers > Firmware
 - Click Upgrade and install the latest firmware file.
3. Update the firmware of the MPPT controller.
 - Devices > Charge Controllers > Firmware
 - Click Upgrade and install the latest firmware file.

Setting the Insight Device to Use the BMS Configuration

Set up InsightHome or InsightFacility to use the BMS Configuration with InsightLocal.

This setup menu automatically configures the XW PRO according to the selected battery model and the number of batteries in the system. It also configures the XW PRO's Charge Cycle to External BMS, the Battery Type to Li-ion, and SOC Control to Enabled. MPPT Solar Charge Controllers connected to the system will also be automatically configured with the correct charge voltage.

NOTE

- XW PRO, MPPT Solar Charge Controllers, and batteries must have the same association.
- Setting changes are not implemented until they are saved. Ensure that updates to Settings are saved by clicking on the APPLY button.

Set up the BMS Association.

- **> BMS Association**
 - InsightLocal > BMS > Configuration (Advanced) > Device Identification

Device Identification

Device Association

House Battery Bank 1

Device Number

0

Device Name

BMS

Apply

Reset

Figure 10. Device Identification

Device Identification

1. From the Device Association drop-down menu, select the appropriate Battery
2. **Click APPLY.**

Ensure the BMS Association is completed before the BMS Setup settings are applied.

• > BMS Setup

- InsightLocal > Setup > BMS Setup

BMS Setup

Setup XW Pro inverters and MPPT charge controllers for Battery Management System (BMS) integration.

Battery Type

Discover AES 42-48-6650

Quantity

1

Match MPPT Voltage to BMS

Enabled

MPPT Voltage Offset

1 V

Status

Successful

Clear

Apply

Figure 11. BMS Setup

InsightLocal > BMS Setup	System Values
BatteryType	Select the appropriate Discover Lithium battery model
Quantity	Specify the number of Discover Lithium batteries
Match MPPT Voltage to BMS	Set to ENABLED
MPPT Voltage Offset	Set to 1.0 V

Verification of Battery Network Connections

Review the following steps to verify that all batteries communicate with the LYNK II Gateway and the Schneider system.

- Devices > Inverter/Chargers > 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 that the Discover AEBus 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 batteries are visually represented by a Conext Battery Monitor image when viewed on InsightLocal or InsightCloud.

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.
- Most values are automatically communicated by the Discover batteries when closed-loop connected through the Schneider BMS protocol. LYNK II does not configure these settings. Some values are dynamic and will constantly change when in a closed-loop operation and cannot be overridden by the user.
- If closed-loop communications fail, preset open-loop (Comms Lost) values for XW PRO open-loop operation are selected by the Battery Type during the BMS Setup. 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 with Discover Lithium batteries SOC Control is the default setup for all XW PRO systems.

Using InsightLocal, there are three required steps to set up XW PRO

1. > Battery Management System Settings

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

2. > Battery Settings

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

3. > Charger Settings

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

NOTE

Setting changes are not implemented until they are saved. Ensure that updates to Settings are saved by clicking on the APPLY button.

XW PRO – Battery Management System Settings

InsightLocal > Devices > Inverter/Charger > Configuration (Advanced) > Battery Management System Settings

Battery Management System Settings

BMS Communication Loss Triggers Fault or Warning	Warning	Charge Overcurrent Offset	0	A
BMS Communication Loss Trip Time	10	Charge Overcurrent Trip Time	10	s
SOC Communication Loss Triggers Fault or warning	Warning	Discharge Overcurrent Offset	92	A
SOC Communication Loss Trip Time	7	Discharge Overcurrent Trip Time	2	s
Comms Lost Battery Charge Voltage Limit	54.4	Overvoltage Offset	2	v
Comms Lost Battery Discharge Voltage Limit	48	Overvoltage Trip Time	10	s
Comms Lost Battery Charge Current Limit	130	Undervoltage Offset	0	v
Comms Lost Battery Discharge Current Limit	130	Undervoltage Trip Time	0	s

Apply

Reset

Figure 12. Battery Management System Settings

InsightLocal > Battery Management System Settings	System Values
BMS Communication Loss Triggers Fault or Warning (Fault, Warning)	Set the preferred response of XW PRO when communication is lost with the Battery Management System (BMS). Fault: Activates fault F90 and goes offline. Warning: Activates warning W90 and uses the measured battery voltage for control with the BMS Comms Lost Battery parameters until communication is restored.
BMS Communication Loss Trip Time (Seconds)	XW PRO defaults to a 10-second delay before a fault or warning is triggered after losing communication with the BMS.
SOC Communication Loss Triggers Fault or Warning (Fault, Warning)	Set the preferred response of XW PRO when there is a loss of State of Charge (SOC) communications. Fault: Activates fault F90 and goes offline. Warning: Activates warning W90 and uses the measured battery voltage to control the Comms Lost Battery parameters until communication is restored.
SOC Communication Loss Trip Time (Seconds)	XW PRO defaults to a 7-second delay before a fault or warning is triggered after losing SOC Communication.
Comms Lost Battery Charge Voltage Limit (V)	When a Discover battery is selected in BMS Setup, XW PRO defaults to 54.4 V when Comms Lost (Open-loop). This value is used if BMS or battery SOC communication is lost.

InsightLocal > Battery Management System Settings	System Values
Comms Lost Battery Discharge Voltage Limit (V)	When a Discover battery is selected in BMS Setup, XW PRO defaults to 48.0 V when Comms Lost (Open-loop). This value is used if BMS or battery SOC communication is lost.
Comms Lost Battery Charge Current Limit (A)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 130 A for a single 42-48-6650, 57 A for a single 44- 48-3000 (114 A for two), 29 A for each DLP-GC2-48V, and 95 A for a single 48-48-5120 when Comms Lost (Open-loop). This value is used if BMS communication is lost.</p> <p>NOTE: XW PRO defaults to 140 A when there are multiple batteries.</p>
Comms Lost Battery Discharge Current Limit (A)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 140 A when multiple batteries are utilized. Otherwise, it defaults to 130 A for a single 42-48-6650, 57 A for a single 44-48-3000 (114 A for two), 58 A for each DLP-GC2-48V, and 95 A for a single 48-48-5120 when Comms Lost (Open-loop). This value is used if BMS communication is lost.</p> <p>NOTE: XW PRO defaults to 140 A when there are multiple batteries.</p>
Charge Overcurrent Offset (A)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 0 A.</p> <p>When Charge Cycle is set to External BMS, the offset is added to the charge overcurrent limit broadcasted by the BMS (or the Comms Lost Charge Current Limit) to determine the inverter's trip threshold. When operating off-grid with AC coupling enabled, the inverter follows the BMS charge current limit by frequency-shifting AC-coupled PV. The inverter triggers fault F73 if the current exceeds the trip threshold for the number of seconds specified in the Charge Overcurrent TripTime property.</p>
Charge Overcurrent TripTime (Seconds)	When a Discover battery is selected in BMS Setup, XW PRO defaults to a 10-second delay before an F73 fault is triggered when the Charge Overcurrent trip threshold is exceeded (refer to Charge Overcurrent Offset).
Discharge Overcurrent Offset (A)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 0 A.</p> <p>When Charge Cycle is set to External BMS, the offset is added to the discharge current limit broadcasted by the BMS (or the Comms Lost Battery Discharge Current Limit) to determine the inverter's trip threshold. When operating off-grid, the inverter follows the loads until it hits the trip threshold. The inverter triggers fault F71 if the current exceeds the trip threshold for the number of seconds specified in the Discharge Overcurrent TripTime property.</p>

InsightLocal > Battery Management System Settings	System Values
Discharge Overcurrent TripTime (Seconds)	When a Discover battery is selected in BMS Setup, XW PRO defaults to a 2 s delay before an F71 fault is triggered when the Discharge Overcurrent trip threshold is exceeded (refer to Discharge Overcurrent Offset).
Overvoltage Offset (V)	<p>The recommended setting is 2.0 V. XW PRO defaults to 0.5 V.</p> <p>When Charge Cycle is set to External BMS, the offset is added to the charge voltage limit broadcasted by the BMS (or the Comms Lost Charge Voltage Limit) to determine the inverter's trip threshold. The inverter triggers fault F75 if the voltage exceeds the trip threshold for the number of seconds specified in the OvervoltageTripTime property.</p>
OvervoltageTripTime (Seconds)	When a Discover battery is selected in BMS Setup, XW PRO defaults to a 10-second delay before an F75 fault is triggered when the Overvoltage trip threshold is exceeded (refer to Overvoltage Offset).
Undervoltage Offset (V)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 0 V.</p> <p>When Charge Cycle is set to External BMS, the offset is subtracted from the discharge voltage limit broadcasted by the BMS (or the Comms Lost Discharge Voltage Limit) to determine the inverter's trip threshold. The inverter triggers fault F74 if the voltage falls below the trip threshold for the seconds specified in the UndervoltageTripTime property.</p>
UndervoltageTripTime (Seconds)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to a 0-second delay before an F74 fault is triggered by exceeding the Undervoltage trip threshold (refer to Undervoltage Offset).</p> <p>The time delay from when the battery voltage falls below the trip threshold (refer to Undervoltage Offset) until the inverter triggers fault F74.</p>

XW PRO – Battery Settings

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

Battery Settings

Battery Type

Li-Ion

Maximum Discharge Current

130

A

Charge Cycle

External BMS

Maximum Discharge Time Interval

5

s

SOC Control Enable

Enabled

Low battery Cut Out

43.28

V

Battery Bank Capacity

130

Ah

Low battery Cut Out Delay

4

s

Maximum Charge Rate

100

%

Low Battery Cut Out Hysteresis

8

V

Maximum Bulk Charge Current

130

A

Low Battery Cut Out Warning Offset

0.7

V

Maximum Absorption Charge Current

130

A

High Battery Cut Out

58

V

Maximum Float Charge Current

130

A

Charge Cycle Timeout

240

min

Default Battery Temperature

Warm

High SOC Cut Out

99

%

Absorption Time

10800

s

High SOC Cut Out Delay

60

s

Bulk/Boost Voltage Set Point

58

V

Low SOC Cut Out

10

%

Absorption Voltage Set Point

58

V

Low SOC Cut Out Delay

60

s

Apply

Reset

Figure 13. Battery Settings

InsightLocal > Battery Settings	System Values
BatteryType (Flooded, GEL, AGM, Custom, Li-ion)	When a Discover battery is selected in BMS Setup, this defaults to Li-ion.
Charge Cycle (3 Stage, 2 Stage, External BMS)	When a Discover battery is selected in BMS Setup, this defaults to External BMS.
SOC Control Enable (Enabled / Disabled)	When a Discover battery is selected in BMS Setup, this defaults to Enabled. State-of-Charge (SOC) is considered more reliable than DC voltage as a trigger value.
Battery Bank Capacity (Ah)	<p>This value must be set to the number of batteries in the system multiplied by the rated capacity of the Discover Lithium battery.</p> <p>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 100 A for a single 48-48-5120.</p>

InsightLocal > Battery Settings	System Values
Maximum Charge Rate (%)	<p>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).</p> <p>The maximum charging current delivered by the entire system should not exceed the maximum charge current rating of the entire battery system.</p>
Maximum Bulk Charge Current (A)	<p>XW PRO defaults to 140 A. However, it must be set to 130 A for a single 42-48-6650, 57 A for a single 44-48-3000 (114 A for two), 29 A for each DLP-GC2-48V, and 95 A for a single 48-48-5120.</p> <p>This value is used if BMS communication is lost and XW PRO operates in open loop. When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-current fault.</p>
Maximum Absorption Charge Current (A)	<p>XW PRO defaults to 140 A. However, it must be set to 130 A for a single 42-48-6650, 57 A for a single 44-48-3000 (114 A for two), 29 A for each DLP-GC2-48V, and 95 A for a single 48-48-5120.</p> <p>This value is used if BMS communication is lost and XW PRO operates in open loop. When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-current fault.</p>
Maximum Float Charge Current (A)	<p>XW PRO defaults to 140 A. However, it must be set to 130 A for a single 42-48-6650, 57 A for a single 44-48-3000 (114 A for two), 29 A for each DLP-GC2-48V, and 95 A for a single 48-48-5120.</p> <p>This value is used if BMS communication is lost and XW PRO operates in open loop. When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-current fault.</p>
Default Battery Temperature (Hot, Warm, Cold)	<p>XW PRO defaults to Warm when Comms Lost (open loop).</p> <p>When operating in a closed loop, the BMS communicates the internal battery temperature.</p>
AbsorptionTime (Seconds)	<p>When operating in a closed loop, the BMS communicates this value.</p> <p>XW PRO defaults to 10800 s (3.0 Hr) when Comms Lost (open loop).</p>
Bulk/Boost Voltage Set Point (V)	<p>When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.</p> <p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 54.4 V in Comms Lost (Open-loop).</p>
InsightLocal > Battery Settings	System Values

Absorption Voltage Set Point (V)	<p>When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.</p> <p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 54.4 V in Comms Lost (Open-loop).</p>
Maximum Discharge Current (A)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 150 A for a single 42-48-6650, 65 A for a single 44-48-3000, 35 A for a single DLP-G C2-48V, and 115 A for a single 48-48-5120 when Comms Lost (Open-loop). This value is used if BMS communication is lost.</p> <p>XW PRO defaults to this value when operating in Comms Lost (Open-loop).</p>
Maximum Discharge Time Interval (Seconds)	<p>This value defaults to 8 seconds to avoid the BMS disconnecting a single battery. With more than one battery, a higher value can be used.</p>
Low Battery Cut Out (V)	<p>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.</p> <p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 48 V when operating in Comms Lost (Open-loop).</p>
Low Battery Cut-Out Delay (Seconds)	<p>The recommended setting is 10 seconds or less.</p> <p>Setting the Low Battery Cut Out Delay avoids unnecessary Battery Management System (BMS) safety feature engagement.</p>
Low Battery Cut Out Hysteresis (V)	<p>When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary. XW PRO will default to 2 V when operating in Comms Lost (Open-loop).</p>
Low Battery Cut Out Warning Offset (V)	<p>When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary. XW PRO will default to 2 V when operating in Comms Lost (Open-loop).</p>
High Battery Cut Out (V)	<p>When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary. XW PRO will default to 58 V when operating in Comms Lost (Open-loop).</p>
Charge Cycle Timeout (Minutes)	<p>When operating in a closed loop, the BMS will communicate this value, and the displayed value will vary. XW PRO will default to 240 minutes when operating in Comms Lost (Open-loop).</p> <p>The recommended setting is 480 minutes.</p>
High SOC Cut Out (%)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 99 % when operating in a closed loop. XW PRO uses High Battery Cut Out (V) when operating in an open loop.</p> <p>Setting the High Battery Cut Out delay avoids unnecessary engagement of the Battery Management System (BMS) safety features.</p>

InsightLocal > Battery Settings	System Values
High SOC Cut-Out Delay (Seconds)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 60 s when operating in a closed loop.</p> <p>Setting SOC Cut Out delay avoids unnecessary engagement of the Battery Management System (BMS) safety features.</p>
Low SOC Cut Out (%)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 10 % when operating in a closed loop. XW PRO uses Low Battery Cut Out (V) when operating in an open loop.</p> <p>The battery can be discharged to 100 % Depth of Discharge but must immediately be recharged, or cell damage can occur. An over-discharged battery may not be able to accept a charge and may not be recoverable.</p>
Low SOC Cut-Out Delay (Seconds)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to 60s when operating in a closed loop. XW PRO uses Low Battery Cut Out (V) when operating in an open loop.</p> <p>Setting SOC Cut Out delay avoids unnecessary engagement of the Battery Management System (BMS) safety features.</p>

XW PRO – Charger Settings

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

The screenshot displays the 'Charger Settings' window. It features a left column with three settings: 'Recharge Voltage' (50 V), 'Recharge SOC' (50 %), and 'Recharge SOC Delay' (50 s). The right column contains 'Charge Block Start' and 'Charge Block Stop', both set to 12:00 AM. Each setting is accompanied by a slider and a numeric input field. The interface concludes with 'Apply' and 'Reset' buttons.

Figure 14. Charger Settings

InsightLocal > Charger Settings	System Values
Recharge Voltage (V)	<p>When a Discover battery is selected in BMS Setup, XW PRO defaults to SOC when operating in a closed loop.</p> <p>XW PRO defaults to 51.2 (V) when operating in an open loop.</p>
Recharge SOC (%)	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)	Setting ReCharge SOC Delay higher delays the start.

Charge Block Start	Specify the start time when AC charging is blocked. Charge block specifies when charging from AC (grid) is blocked.
Charge Block Stop	Specify the end time when AC charging is blocked. Charge block specifies when charging from AC (grid) is blocked.

MPPT SOLAR CHARGE CONTROLLER CONFIGURATION SETTINGS – INSIGHTLOCAL

The following settings must be programmed using an InsightHome gateway with InsightLocal software to operate the MPPT Solar Charger Controller in a closed-loop configuration through the Schneider BMS protocol. Most values are automatically communicated by the Discover batteries when closed-loop connected through the Schneider BMS protocol. LYNK II does not configure these settings. Some values are dynamic and will constantly change when in a closed-loop operation and cannot be overridden by the user.

If closed-loop communications fail, the MPPT Solar Charge Controllers will continue to operate in the Last State before communication is lost. The closed-loop operation of the system will resume if communication is re-established.

Using InsightLocal, there are two required steps to set up MPPT Solar Charge Controllers

1. > **Charger Settings**

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

2. > **Battery Settings**

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

NOTE

Setting changes are not implemented until they are saved. Ensure that updates to Settings are saved by clicking on the APPLY button.

MPPT Solar Charge Controller – Charger Settings

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

The screenshot displays the 'Charger Settings' configuration window. It includes the following settings:

- Equalize Voltage Set Point:** 64 V
- Absorption Time:** 180 min
- Equalize Support:** Disabled (toggle switch)
- Equalization Not Allowed:** (checkbox)
- Charge Cycle:** 3 Stage
- Bulk/Boost Voltage Set Point:** 55.38 V
- Maximum Charge Rate:** 100 %
- Float Voltage Set Point:** 55.38 V
- Equalize Now:** Disabled (toggle switch)
- Recharge Voltage:** 50 V
- Default Battery Temperature:** Warm
- Absorption Voltage Set Point:** 55.38 V

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

Figure 15. Charger Settings

CAUTION

FIRE AND BURN HAZARD

- Do not perform an equalization charge on a Discover Lithium battery.
- Failure to follow these instructions may result in minor to moderate injury.

NOTICE

If closed-loop communications fail, the MPPT Solar Charge Controllers will continue to operate in the Last State before communication is lost.

InsightLocal > Charger Settings	System Values
Equalization Voltage Set Point (V)	<p>When a Discover battery is selected in BMS Setup, the Equalization Voltage Set Point will be Disable (Ignore any value displayed).</p> <p>Note: a Lithium battery should never be equalized.</p>
Equalize Support (Yes/No)	<p>When a Discover battery is selected in BMS Setup, Equalization Support will be disabled.</p> <p>Note: a Lithium battery should never be equalized.</p>
Bulk/Boost Voltage Set Point (V)	<p>Ignore the displayed value.</p> <p>When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.</p>
Float Voltage Set Point (V)	<p>Ignore the displayed value.</p> <p>When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.</p>
Recharge Voltage (V)	<p>When the Charge Cycle is set to 3-Stage, ReCharge Voltage will be Disabled (Ignore any value displayed).</p>

Absorption Voltage Set Point (V)	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.
AbsorptionTime (Minutes)	When operating in a closed loop, this value is dynamically managed to charge and balance efficiently without causing an over-voltage fault.
Charge Cycle (3 Stage, 2 Stage)	Set to 3-stage to provide current for parasitic loads.
Maximum Charge Rate (%)	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 (Enabled/ Disabled)	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.
Default BatteryTemperature (Hot, Warm, Cold)	When operating in a closed loop, the BMS will communicate the internal battery temperature. The default is warm. (Ignore the displayed value.)

MPPT Solar Charge Controller – 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 16. Battery Settings

NOTICE

If closed-loop communication fails, the MPPT Solar Charge Controllers continue to operate in the Last State before communication is lost.

InsightLocal > Battery	System Values
BatteryType (Flooded, GEL, AGM, Custom)	Set the value to Custom. Other values conflict with the BatteryType used by the inverter-charger.
Nominal Battery Voltage (24 V / 48 V)	Set the value to 48 V. Other values conflict with the Nominal Battery Voltage and the value used by the XW PRO.
Battery Bank Capacity (Ah)	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 100 A for a single 48-48-5120.
BatteryTemperature Coefficient (mV/°C)	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.

Documents / Resources

	DISCOVER ENERGY SYSTEMS LYNK II Communication Gateway [pdf] User Manual 950-0025, 805-0061 REV B, LYNK II Communication Gateway, Communication Gateway, Gateway
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References

- [Lithium Batteries | Discover Battery](#)
- [Home Solar Inverters & Storage Systems - Schneider Electric Solar Portal](#)