



ADVANCED ENERGY

Lithium Ion Battery

LYNK Edge Card Xanbus User Manual

PN: 950-0016-XNBS

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1. Safety

1.1 Warnings, Cautions and Notes

▲ WARNING

Death or Injury

▲ CAUTION

Equipment Damage

▲ NOTE

Additional Information

1.2 General Warnings

▲ WARNING

HAZARD OF ELECTRICAL SHOCK AND FIRE

- Connect only to Safety Extra Low Voltage (SELV) circuits and power sources.
- All wiring must be completed by qualified personnel to ensure compliance with applicable installation codes and regulations.

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

▲ WARNING

HAZARD OF ELECTRICAL SHOCK AND FIRE

- Do not install LYNK outdoors.
- Do not connect any port of the LYNK to a network with power over Ethernet (POE) or to a public telecommunication network.
- Do not run CAT5 cables or other cables connected to LYNK through conduit that could be exposed to lightning strikes.

Failure to follow these instructions can damage equipment.

2. Documentation

This User Manual provides information about the integration of Discover AES Lithium batteries with Xanbus enabled Schneider Electric Conext components in a Closed Loop configuration using the AES LYNK Communication Gateway.

AES battery can be used in Grid backup and Off-grid applications. These instructions apply to an Off-grid application.

AES LYNK Communication Gateway with installed AES LYNK Edge Card for Xanbus automatically configure critical battery related settings and in most cases user configuration is not required.

The AES LYNK Communication Gateway provides more accurate battery status readings than the inverter/charger. The AES LYNK Communication Gateway will dynamically control the charge characteristics of the inverter/charger and charge controllers by using its internal voltage, current, and temperature measurements of connected AES Batteries. This will reduced charging time and provide for intelligent battery balancing.

Schneider Electric Reference Documents:

- Schneider Electric 975-0239-01-01 Conext XW+ Installation Guide
- Schneider Electric 975-0800-01-02 Conext XW Pro NA Installation Guide
- Schneider Electric 975-0639-01-01 Conext SW Installation Guide
- Schneider Electric online XW Pro Commissioning guide. URL: <https://solar.schneider-electric.com/xw-pro-commissioning-guide>

Discover Reference Documents:

- Discover Energy 805-0015 AES LiFePO₄ Battery 44-24-2800 42-48-6650 Manual
- Discover Energy 805-0025 AES LiFePO₄ Battery 44-48-3000 Manual
- Discover Energy 805-0017 AES LYNK Communication Gateway User Manual

Visit discoverbattery.com for the most recent version of published documents.

Certain configuration, installations, service, and operating tasks should only be performed by qualified personnel in consultation with local utilities and/or authorized dealers. Qualified personnel should have training, knowledge, and experience in:

- Installing electrical equipment
- Applying applicable installation codes
- Analyzing and reducing hazards involved in performing electrical work
- Installing and configuring batteries

No responsibility is assumed by Discover for any consequences arising out of the use of this material.

Read AES Battery Manual and Safety instructions before installing the battery.

Read Schneider Electric manuals for guidance on product features, functions, parameters and how to use the product safely.

3. Overview

3.1 System Overview

The AES LYNK Communication Gateway unlocks the full potential of a Discover AES LiFePO₄ Battery by optimizing the charge and discharge configurations of the world's best inverter chargers and solar charge controller systems in a closed loop configuration.

AES LiFePO₄ batteries must be set up to work with Power Conversion and Monitoring devices in either an Open Loop or Closed Loop configuration.

AES LiFePO₄ battery charge and discharge settings in a Open Loop configuration are set up manually through the controller for the Power Conversion device at the time of installation. This is commonly referred to as a 'lead acid drop-in replacement' configuration.

In a Closed Loop configuration the battery charge and discharge rates and settings are dynamically controlled by the BMS of the AES LiFePO₄ Battery over a connection with the power conversion devices in the network.

To connect with the communication network of a specific brand of inverter charger or solar charge controller, the LYNK Communication Gateway requires an AES LYNK Edge Card with the appropriate communication port.

3.2 Minimum Battery Capacity

Battery charge and discharge rates are managed automatically by the AES LiFePO₄ Battery and Sunny Island. Using very 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 be sized to accept the maximum charge current of the system, or the charging devices must be curtailed to charge below the operating limit of the installed batteries. This value is derived by adding together the charge capacities of all inverter/chargers and solar charge controllers in the system. Additionally, battery peak capacity must be sized to support the surge requirements demanded by the load attached to the inverter. Match the sum of all inverter peak power values with the sum of all battery peak battery current values.

Model	Inverter Peak Amp DC 48V (90% Efficiency)	Discharge Current Amp DC	Max Charge Current Amp DC	Single Phase Minimum		Three Phase Minimum	
				42-48-6650	44-48-3000	42-48-6650	44-48-3000
XW+ 8548	278 (1 min)	180	140	2	4	5	10
XW+ 7048	220 (1 min)	150	110	2	3	4	8
XW Pro 6848	278 (1 min)	180	140	2	4	5	10
XW+ 6848	278 (1 min)	180	140	2	4	5	10
XW+ 5548	220 (1 min)	150	110	2	3	4	8
SW 4048 120 / 240	162 (5 sec)	88	45	1	2	n/a	n/a
SW 4048 230	162 (5 sec)	88	45	1	2	n/a	n/a

Model	Inverter Peak Amp DC 24V (90% Efficiency)	Discharge Current Amp DC	Max Charge Current Amp DC	Single Phase Minimum 44-24-2800
SW 2524 120 / 240	231 (5 sec)	138	65	2
SW 4024 120 / 240	324 (5 sec)	157	90	2
SW 2524 230	231 (5 sec)	138	65	2
SW 4024 230	324 (5 sec)	157	90	2

4. Installing LYNK and Connecting LYNK to the Xanbus Network

4.1 Installing the LYNK Edge Card

The LYNK Edge Card for Xanbus is a Slot 0 Type which only inserts into the left side slot on the bottom of the LYNK Communication Gateway.



Figure 1. Slot 0 Type

▲ NOTE

- The LYNK Edge Card type to be used is determined by the brand of power conversion equipment.
- If LYNK Edge Card is in the wrong slot, it will not function.
- If LYNK Edge Card is not firmly seated, it will not function.

4.2 Connecting LYNK to the AES Battery

Connect the AES LYNK Communication Gateway to the AES LiFePO₄ Battery and power up as described in the LYNK Communication Gateway Users Manual.

▲ CAUTION

HAZARD OF EQUIPMENT DAMAGE

- Do not plug the AEBus RJ-45 cable terminator into the 10/100 Ethernet port of the LYNK.
 - Do not connect a CAT5 cable from the 10/100 Ethernet port of the LYNK to the WAN or MODEM port of a network router.
 - Turn OFF all devices before connecting cables or inserting an Edge Card.
- Failure to follow these instructions can damage equipment.

▲ NOTE

- Power electronics are not AEBus devices and should not be connected to AEBus.

4.3 Connecting LYNK to the Xanbus Network

Xanbus enabled devices communicate with each other over the Xanbus network to share settings, activity and other updates. It is a requirement for only one LYNK to be connected to the Xanbus network. The AES network of batteries will communicate as 'one battery' through the LYNK gateway, providing battery bank settings, activity and real time status to the other devices on the Xanbus network.

▲ CAUTION

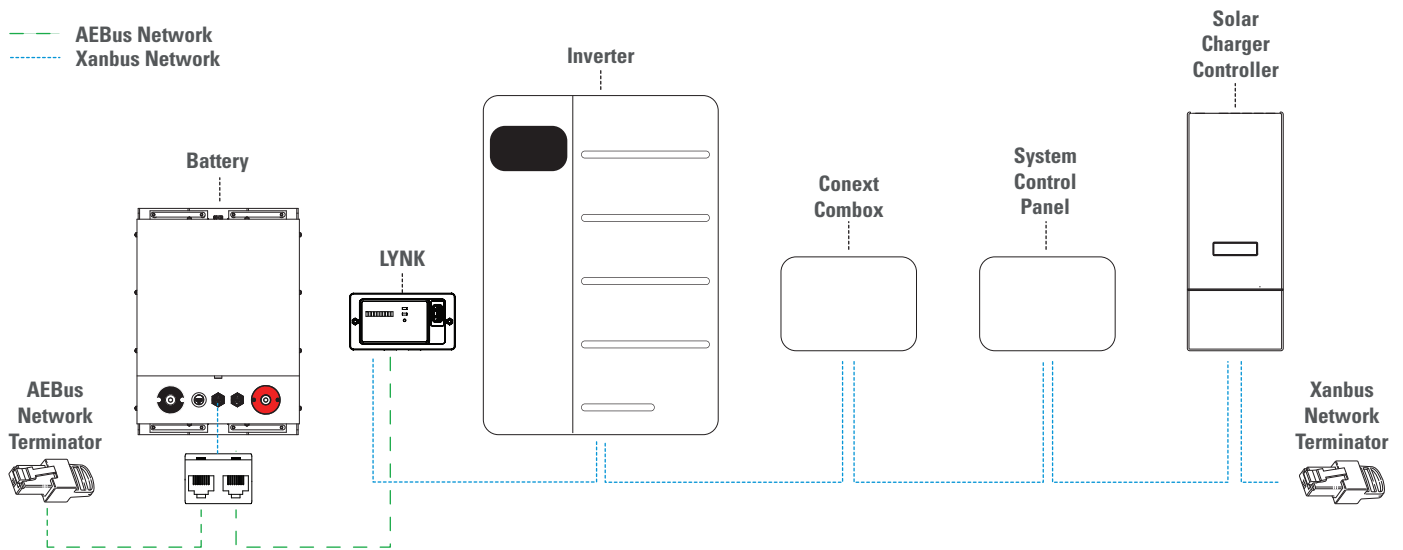
Only one LYNK Gateway is required to be connected to the Xanbus network. Failure to do so could result in impaired system performance.

▲ NOTE

- The Internal LYNK Xanbus network is terminated.
- There is no network terminator required on the LYNK Xanbus connection.
- LYNK Xanbus must be installed at the end of the Xanbus network

▲ NOTE

- The Internal LYNK AEBus network is terminated.



4.4 Verification of Network Connections

4.4.1 Verification of Xanbus Network Connections

To verify that all batteries are communicating over Xanbus, please review the following steps.

In the Select Device screen of the Conext System Control Panel (SCP), all networked Discover AES LiFePO₄ batteries will appear as a single battery (Displayed as BattMon 00 with the XW+ / Combox, or as Discover AES with the XW Pro / Gateway). To view this screen, follow the steps below:

- **SCP** (System Status screen) → Enter button → (Select Device screen)
- Once in this screen navigate with the ▲ and ▼ buttons to locate the BattMon 00 device. If the BattMon 00 / Discover AES is listed, the Discover AES battery connection was successful.
- If connection is unsuccessful, check that 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.

4.4.2 Verification of AEBus Network Connections

To verify that all batteries are communicating over AEBus follow the steps below:

- **SCP** (System Status Screen) → Enter Button → (Select Device Screen) → ▲ and ▼ buttons to select (BattMon 00 / Discover AES) → press Enter/▲/▼ buttons at the same time to enable access to → (Advanced Settings Menu)

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

Product	44-24-2800	42-48-6650	44-48-3000
Capacity	110 Ah x number of batteries	130 Ah x number of batteries	57 Ah x number of batteries

If the connection is unsuccessful, check that 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.

5 Configuration Settings

5.1 Fixed Settings

The settings in the table below are automatically set by AES batteries when they are connected via Xanbus. These settings will automatically be overridden and reset by the AES LYNK Communication Gateway if inadvertently adjusted by the user.

Settings	Nominal System Voltage	
	24 V	48 V
Batt Type	Custom	
High Batt Cut Out	29.2 V	58.4 V
Low Batt Cut Out Hyst	1.8 V	3.5 V
High Batt Cut Out Hyst	1.2 V	2.4 V
High Batt Warning	28.8 V	57.6 V
Low Batt Warning	24.8 V	49.6 V
Low Batt Warning Hyst	1.0 V	1.9 V
High Batt Warning Hyst	0.8 V	1.6 V
Float Voltage	26.8 V	53.6 V
Battery Capacity	Determined by number of AES batteries on the AEBus network. e.g. 2x 42-48-6650 = 260Ah	

5.2 Dynamically Controlled Settings

These settings are dynamically Configured by AES LYNK Communication Gateway through Xanbus Network.

Settings	Nominal System Voltage	
	24 V	48 V
Bulk Voltage	Max is 28.4 V to charge and balance efficiently without causing over voltage fault	Max is 56.8 V to charge and balance efficiently without causing over voltage fault
Absorption Voltage		
Low Batt Cut Out (LBCO)	Min is 21.6 V to allow for maximum discharge without causing under voltage fault	Min is 43.2 V to allow for maximum discharge without causing under voltage fault

▲ NOTE!

Fixed settings and dynamically controlled settings are configured by the AES LYNK Communication Gateway. No user configuration is necessary. These settings are automatically overridden and reset by the AES LYNK Communication Gateway if adjusted by the user.

5.3 Recommended User-Adjustable Battery Related Settings

Recommended User-Adjustable Settings for XW+ Inverter/Charger.

Settings	Description	Nominal System Voltage (48V)	
		42-48-6650	44-48-3000
Grid Supp Volts (GSV)	Setting GSV below 51.5V will likely cause under voltage protection before LBCO setting.	53.6V	
Max Sell Amps	Adjust to match PV array size. PV array rated Watts (STC) / Local AC Voltage. (240 V split phase 60Hz, 120 V single phase 60 Hz, or 230 V 50 Hz)		
ReCharge Volts	Setting ReCharge Volts higher allows for more back-up capacity. Setting lower helps maximize self consumption.	52.8 V	
Max Chg Rate	Limited to maximum battery bank current ($\leq 1C$). ¹	Number of installed batteries x 130A	Number of installed batteries x 57A
Charge Cycle	2-Stage.		

¹ The max charge rate of each inverter charger should be set to the allowable battery bank current, divided by the total number of inverter chargers in parallel.

Recommended User-Adjustable Settings for the SW Inverter/Charger.

Settings	Description	Battery Model		
		44-24-2800	42-48-6650	44-48-3000
AC Supp on SoC	Enables the SOC monitoring for AC support mode.	Enabled	Enabled	
AC Supp Start SoC	Sets high SOC value required for AC support to engage.	80%	80%	
AC Supp Stop SoC	Sets low SoC value for AC support to disengage.	20%	20%	
ReCharge Volts	Setting ReCharge Volts Higher allows for more back-up capacity. Setting lower helps maximize self consumption.	26.4 V	52.8 V	
Max Chg Rate	Limited to maximum battery bank current ($\leq 1C$). ¹	Number of installed batteries x 110A	Number of installed batteries x 130A	Number of installed batteries x 57A
Charge Cycle	2-Stage.			

¹ The max charge rate of each inverter charger should be set to the allowable battery bank current, divided by the total number of inverter chargers in parallel.

▲ NOTE!

User-Adjustable settings are configured by the user.

Recommended User-Adjustable Settings for Solar Charge Controllers.

Settings	Description	Battery Model		
		44-24-2800	42-48-6650	44-48-3000
Max Chg Rate	Limited to maximum battery bank current ($\leq 1C$). ¹	Number of installed batteries x 110A	Number of installed batteries x 130A	Number of installed batteries x 57A
Charge Cycle	3-Stage			
Recharge Volts	For grid support, set higher to force charge controller to remain in bulk charge mode.	27 V	54 V	

¹ The max charge rate of each inverter charger should be set to the allowable battery bank current, divided by the total number of inverter chargers in parallel.

Recommended User-Adjustable Settings for Automatic Generator Start (AGS).

AGS Triggers	Nominal System Voltage	
	24 V	48 V
Start DCV 30 sec	25 V (LBCO +1V)	49 V (LBCO +1 V)
Stop Absorb	Disabled	Disabled
Start SoC	> 10%	> 10%
Stop SoC	< 95%	< 95%

ReCharge Voltage Setting Guidance

Remaining Capacity	Nominal System Voltage	
	24 V	48 V
10-15% ²	24.5 V	49 V
15-20%	25 V	50 V
20-30%	25.8 V	51.5 V
40-50%	26 V	52 V
80-90%	26.3 V	52.5 V
90-100%	27 V	54 V

² Not recommended. Inverter may display Low Battery Warning.

