



ADVANCED ENERGY

Lithium Ion Battery

LYNK Edge Card Studer Innotec User Manual

PN: 950-0016-STDR

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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 will result in death or serious injury.

▲ CAUTION

HAZARD OF EQUIPMENT DAMAGE

- 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. Overview

The AES LYNK Communication Gateway unlocks the full potential of a Discover AES LiFePO₄ Battery by enabling the internal Battery Management System (BMS) to optimize the charge and discharge configurations of the world's best residential inverter chargers and solar charge controller systems.

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.

There are some notable differences when configuring your Discover AES installation versus conventional lead acid batteries.

AES batteries must be set up to work with Power Conversion and Monitoring devices in either an Open Loop or Closed Loop configuration. The 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. In a Closed Loop configuration, charge and discharge settings are dynamically controlled by the BMS of the AES Battery over a connection with the Power Conversion device network.

This User Manual provides information about the integration of Discover AES Lithium batteries with Studer Innotec devices in a Closed Loop configuration.

In a Closed Loop configuration the AES LYNK Communication Gateway with installed AES LYNK Edge Card for Studer Innotec products will be connected directly to the Studer Xcom-CAN device, which will communicate with other networked Studer products such as VarioTrack, VarioString Xtender and RCC.

Studer Innotec Reference Documents:

- Studer Innotec Xcom-CAN Multi-Protocol Communication Set for Xtender and Vario-systems User Manual
- Studer Innotec Xtender / VarioString / VarioTrack / RCC User Manuals, as required.

Discover Reference Documents:

- Discover Energy 808-0004 42-48-6650 Data Sheet
- Discover Energy 808-0005 44-24-2800 Data Sheet
- Discover Energy 805-0015 AES LiFePO₄ Battery 44-24-2800 42-48-6650 Manual
- Discover Energy 805-0017 AES LYNK Communication Gateway User Manual

Visit discoverbattery.com and studer-innotec.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.

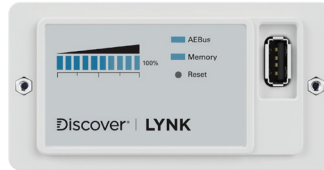
Read AES Battery Manual and Safety instructions before installing the battery.

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

3. Installation

3.1 Installing the LYNK Edge Card

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



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.

3.2 Connecting LYNK to the AES LiFePO₄ 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

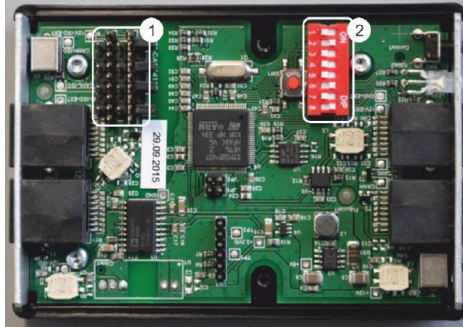
- Do not plug an AEBus RJ-45 cable terminator into the 10/100 Ethernet port of the LYNK.
 - Do not connect a CAT5 cable from the 10/100 Ethernet port of the LYNK to the WAN or MODEM port of a network router.
 - Turn OFF all devices before connecting cables or inserting an Edge Card.
- Failure to follow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

▲ NOTE

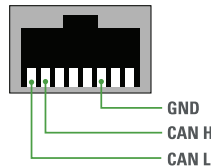
- Power electronics are not AEBus devices and should not be connected to AEBus.

3.3 Studer Xcom-CAN Device Set Up

Connecting LYNK to a Studer Network requires the use of a Studer Xcom-CAN device. Before installing the Xcom-CAN device, open it and set up the Jumper Array (1) which controls the RJ45 pin-out and then set the Battery Protocol DIP switches (2) for AES LiFePO₄ battery. Refer to the Studer Xcom-CAN User Manual for detailed instructions.



Set the Jumper Array (RJ45 pin-out) to GND = 3, CAN_L = 8, CAN_H = 7. Refer to the Studer Xcom-CAN User Manual for detailed instructions.



○	NU	NU		
CAN H	1	CAN L	2	CAN H
	GND		GND	
CAN H	3	CAN L	4	CAN H
	NU		NU	
CAN H	5	CAN L	6	CAN H
	GND		GND	
CAN H	7	CAN L	8	CAN H
	NU		NU	

Set the DIP switches to 1-ON, 2-ON, 3-ON, 4-OFF, 5-OFF, 6-ON, 7-OFF, 8-ON (see below). Refer to the Studer Xcom-CAN User Manual for detailed instructions.

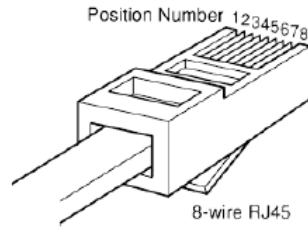


▲ NOTE

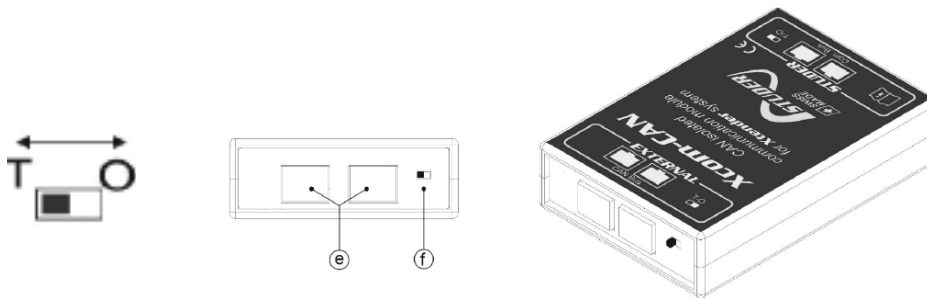
- The AES LiFePO₄ Battery bus speed is 250 kbs.

3.4 Connecting LYNK to the Studer Network

The 2m 8-wire RJ45 communication cables provided with the Xcom-CAN should be used, longer lengths should be avoided.

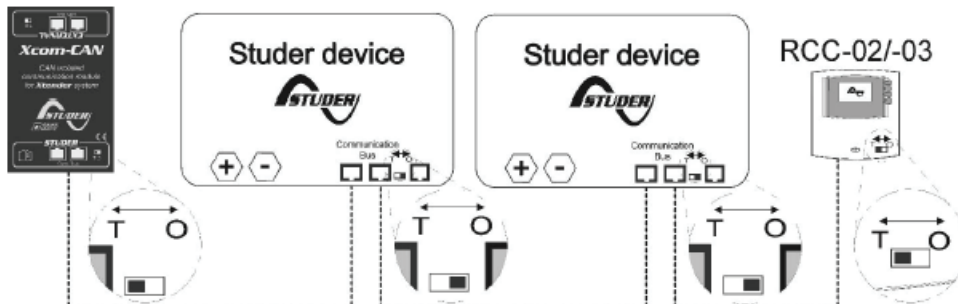


Insert one end of the Studer communication cable into the LYNK Edge Card port and the other end into one of the RJ45 ports (e) on the end of the Studer Xcom-CAN module labeled EXTERNAL. Ensure the termination switch (f) is placed in the T position (terminated).



▲ CAUTION
<ul style="list-style-type: none"> Do Not connect the LYNK Edge Card to the ports labeled STUDER. Do Not connect Ethernet devices to the ports labeled EXTERNAL
▲ NOTE
<ul style="list-style-type: none"> The default position for the termination switch (f) is T (terminated).

The Studer bus is daisy chained to other XT /VT /VS / RCC Studer components and is powered by the communication cable as soon as the upfront device is powered. Connect the Studer components to the end of the Xcom-CAN module labeled STUDER using the Studer supplied 2m communication cable. When only one RJ45 port is used, ensure the termination switch is placed in the T position (terminated). When both RJ45 ports are used, the termination switch MUST be placed in the O position (open). Refer to the Studer Xcom-CAN User Manual for detailed instructions.



▲ CAUTION

- Do Not extend the 2m communication cable.
- Do Not connect the Xcom-CAN between devices powered by the battery.
- Do Not connect the Xcom-CAN module to a device not connected to the battery (RCC or other Xcom-CAN).

▲ NOTE

- A Studer BSP device CANNOT be used with a Lithium battery.

4. Operation

4.1 Selecting the Studer Operating Mode

The Studer Xcom-CAN module supports two modes of operation 'Activity Control' and 'Activity Inspect'.

Activity Control mode enables the automatic and dynamic use of parameters provided by the BMS of the AES LiFePO₄ Battery. This is known as a 'closed loop' system. In this mode the system is plug and play, and the battery configuration menus for Studer Xtender, VarioTrack and VarioString are removed from the RCC. In Activity Control operation mode, a third party controller (e.g. SCADA, PLC) may be used in a supervisor function, but this is not mandatory. The Xcom-CAN should be set to Activity Control Mode, when used with LYNK.

Activity Inspect mode enables CONTROL by a third party system (e.g. SCADA, PLC) and the Xcom-CAN module acts as an interface between the battery BMS and that system. Refer to the Studer Xcom-CAN User Manual for detailed instructions.

Activity Control: DIP switch 4 must be in the ON position.

Activity Inspect: DIP switch 4 must be in the OFF position.

4.2 Battery Monitoring with Studer RCC

If a Studer Remote Control (RCC) is present, battery information is available in a specific screen dedicated to the battery. Four data values related to the battery can be selected for display. The battery icon presents the battery State of Charge (SoC) visually, and when the icon is selected, the last five days of SoC history is displayed.

4.3 Battery and Studer System Settings with Studer RCC

To set up the operation the Studer system, preferred SoC trigger values for Backup and Grid Feeding can be set. These parameters are dependent on each other and must be set together. Studer defaults for both these values are 100%. Refer to the Studer Xcom-CAN / Xtender / Vario User Manuals for detailed instructions.

SoC Level for Backup (Studer Menu 6062) - This parameter defines a SoC value that will be maintained by the Xtender / Vario system. This is the energy reserve in case of grid failure (blackout or disconnection). Energy to maintain this level of SoC is taken in priority from VarioTrack or VarioString. If there is not enough energy from DC coupled sources, energy is taken from the grid through AC-in of the Xtender, until the SoC value is met. Studer default for this value is 100%.

SoC for Grid Feeding (Studer Menu 6063) - If grid feeding has been enabled, this parameter defines a SoC value from which the system starts to feed the grid. If energy is available from DC coupled sources when the SoC reaches this parameter value, the system will feed the extra amount of energy from the VarioTrack / VarioString to the grid. Studer default for this value is 100%.

▲ NOTE

- It is not possible to set SoC for backup (6062) at a value higher than SoC for grid feeding (6063).
- It is not possible to set SoC for grid feeding (6063) at a value lower than SoC for backup (6062).

4.4 Typical Studer System Activity Mode Settings

Backup Application

Fully charged battery ready in case of grid failure or disconnection.

Xcom-CAN Settings

6063 SoC for grid feeding: 100%
6062 SoC for backup: 100%

Xtender Settings

1127 Grid feeding allowed: NO
1125 Charger allowed: YES
1124 Inverter allowed: YES
1126 Smart-boost allowed: YES
1107 Max input current of AC source: Set to the value corresponding to the AC breaker at input.

DC Coupled Self-Consumption

Battery backup SoC level is maintained, above this level only DC coupled devices (VarioTrack / VarioString) are used to charge the battery. At 90% SoC grid feeding is allowed.

Xcom-CAN Settings

6063 SoC for grid feeding: 90%
6062 SoC for backup: 10%

Xtender Settings

1127 Grid feeding allowed: YES
1125 Charger allowed: YES
1124 Inverter allowed: YES
1126 Smart-boost allowed: YES
1107 Max input current of AC source: Set to the value corresponding to the AC breaker at input.

▲ NOTE

- Xcom-CAN in conjunction with LYNK and the AES battery will automatically initialize the DC voltage / Current parameters of the system.
- All other parameters, not related to battery management and/or specific to the installation must be set as described in the Studer User Manuals for XT / VT / VS devices.

4.5 Battery Current Limits (6064) with Studer RCC

The AES LiFePO₄ Battery does Not send separate 'recommended' values or 'limit' values for battery charging and discharging currents to the Studer system, it sends only one value.

▲ NOTE

- AES LiFePO₄ Battery will send only one value regardless of whether menu item 6064 is set to YES or NO.

4.6 SoC Level Under Which Battery Discharge is Stopped

This parameter (6070) defines a SoC level under which battery discharge is stopped to prevent battery damage caused by a deep discharge. The Xcom-CAN will automatically disable all Xtender functions that discharge the battery when the actual SoC value is lower than this parameter.

For example, if this parameter is set to 4%, battery discharge will stop once the SoC value reaches 3%. It will only be possible to discharge the battery again once the SoC level reaches 5%.

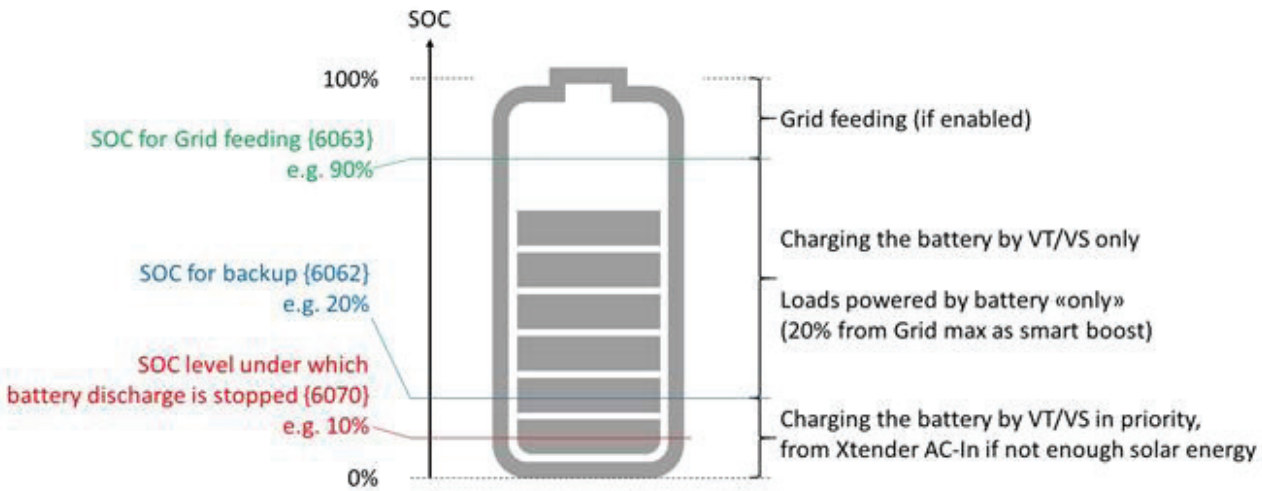
If the parameter is set to 0%, it will be ignored. In this case the discharge of the battery will be stopped by the communication between the BMS and the Xcom-CAN, or by an under voltage detected by one of the Studer devices.

▲ NOTE

- Consumption due to system overhead will not be prevented by this setting (60670).

Xcom-CAN Setting

6070 SoC Level Under Which Battery Discharge is Stopped: > 0%



4.7 Battery Priority as Energy Source When SoC >= SoC for Backup

This parameter controls whether the battery priority is used, when actual SoC is greater than or equal to SoC for Backup setting (6062). This parameter (6071) is set to YES by default.

Xcom-CAN Setting

6071 Battery Priority as Energy Source When SoC >= SoC Backup: YES