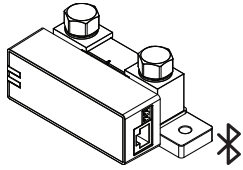
A MISSION CRITICAL ELECTRONICS BRAND



XanLink™ Battery Monitor User Guide

XanLink RV-C (PN: 854-2033)

⚠⚠DANGER

HAZARD OF FIRE, ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

This XanLink™ Battery Monitor User Guide is in addition to, and incorporates by reference, the relevant product manuals for each product in the power system. After reviewing this guide you must read the relevant product manuals. Unless specified, information on safety, specifications, installation, and operation is as shown in the primary documentation received with the product. Ensure you are familiar with that information before proceeding.

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

Exclusion for Documentation

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NOTE: Visit http://www.xantrex.com , click Products, select a Product category, select a Product, and search the Product Documents panel for a translation of the English guide, if available.

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Web:	http://www.xantrex.com

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FCC / ISED Information to the User

This device complies with Part 15 of the FCC Rules / ISED Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC / ISED Canada ICES-003 Rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

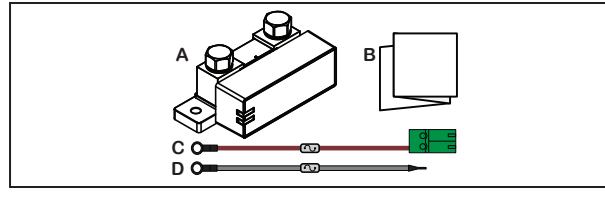
WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Introduction

The XanLink™ Battery Monitor enables precise tracking of battery performance and simplifies energy management via smartphones and multiplex systems. With Bluetooth connectivity, it delivers real-time updates on critical battery metrics–including state of charge (SOC), remaining runtime, and performance history–directly to your smart phone. It uses RV-C communication protocols to seamlessly integrate with multiplex systems, displaying battery data directly on the on board control panel. Compatible with 12V, 24V, 36V, and 48V battery systems, XanLink supports a wide range of battery types, including sealed lead-acid, gel, flooded, and lithium batteries. It can measure up to 500A of charge and discharge currents, combining low power consumption with robust safety features. Designed with an intuitive user interface, the XanLink is easy to install and operate, even in challenging environments. Whether monitoring a single battery or managing a complex system with multiple power sources, the XanLink provides the insights and control needed to optimize battery health and overall system performance.

What's in the box

- **A** XanLink
- **B** Quickstart guide
- **C** Main battery sensing cable
- **D** Starter battery sensing cable

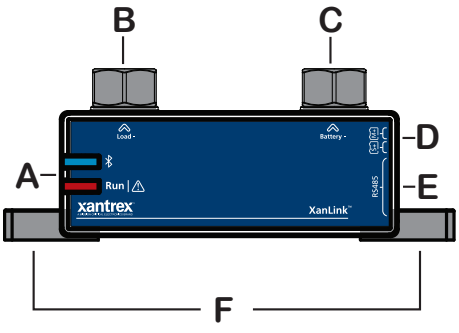


Features

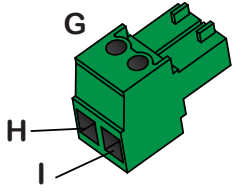
- **Versatile Battery Compatibility**: Suitable for sealed lead-acid, AGM, gel, flooded, and lithium batteries, supporting 12V, 24V, 36V, and 48V systems.
- **High-Precision Monitoring**: Utilizes advanced current sampling technology to measure up to 500A charge and discharge currents with high precision.
- **Advanced SOC Algorithm**: Tracks battery state of charge (SOC), estimates remaining runtime, and calculates cycle count for comprehensive battery health management.
- **Customizable Capacity Settings**: Allows easy configuration of battery capacity to match your specific system requirements.
- **RV-C Communication**: Supports RV-C for advanced networking and system integration with multiplex systems.
- **Bluetooth Connectivity**: Enables real-time monitoring of operating status and battery parameters without the need for additional hardware or an external dongle.
- **Integrated Alarm System**: Provides configurable alerts via Xantrex App for low SOC, high and low voltage, and over current conditions, enhancing system protection.
- **Firmware Update via Bluetooth**: Enables firmware updates directly through Bluetooth, providing a convenient, wireless solution for keeping your XanLink up-to-date.
- **Comprehensive Battery Health Monitoring**: Monitors key battery parameters in real-time, including state-of-charge (SOC), voltage, current, temperature, charging and discharging. Tracks lifetime metrics such as charge cycles, deep discharge, and energy consumption.

- **Battery Performance History**: Stores and provides access to historical battery data, including charging and discharging time durations, minimum and maximum battery voltage, charged and discharged amp-hours (Ah), charged and discharged power (kWh), and minimum and maximum starter battery voltage.
- **Configurable Alarm System**: Provides configurable alarms for critical conditions, including low state of charge (SOC) alarm, overcurrent alarm, high and low voltage alarm, high starter battery voltage alarm , and low starter battery voltage alarm.

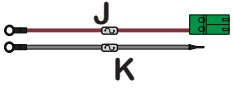
Components



A	Indicator lights
B	Load - negative (–) terminal
C	Battery - negative (–) terminal
D	2-pin battery positive (+) terminal
E	RJ45 port for RV-C/RS-485 communications
F	Flange with mounting holes



G	2-pin connector
H	Starter battery pin terminal, 16AWG (unused)
I	Main battery pin terminal, 16AWG (used)



J	Main battery sensing cable (red)
K	Starter battery sensing cable (gray)

Details

Indicator Lights		Blue ON	Connected to Xantrex App
		Flashing	Data transmission
		Off	Not connected to Xantrex App
	Run | ⚠	Green ON	Operating normally
		Red ON	Alert (see Xantrex App)
2-pin connector port	M+	Main battery (+)	
	S+	Starter battery (+)	
RJ45 connector pins	1	NC	
	2	NC	
	3	Ground	
	4	CAN_L	
	5	CAN_H	
	6	D–	
	7	+5V	
	8	D+	

Installation

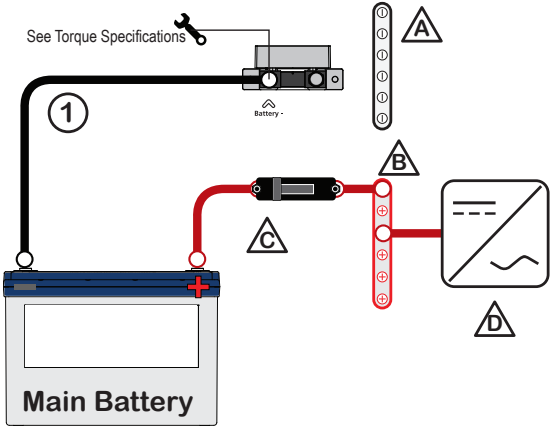
⚠WARNING

HAZARD OF FIRE, ELECTRIC SHOCK, EXPLOSION, AND PERSONAL INJURY

- Do not allow the exposed metal part (negative terminal) to contact the battery's positive terminal, conductive materials, or earth ground.
- Do not touch the exposed metal. Hot surface up to 70°C.
- Install the unit in a well-ventilated area away from direct sunlight, high temperatures, and water intrusion.
- Mount the unit securely using appropriate screws to prevent movement or damage.
- Connect all wires according to the provided wiring diagram.
- Configure all necessary parameters using the Xantrex App after wiring to ensure proper operation.
- Follow national and local electrical codes for all wiring and installations.
- Use wires rated for the current, following the guideline of 5A per mm² or equivalent.
- Inspect the unit and connections for damage or wear before use.

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

Main Battery



1: Connect a battery cable from the Main battery's negative(–) terminal to the XanLink's Battery - terminal.

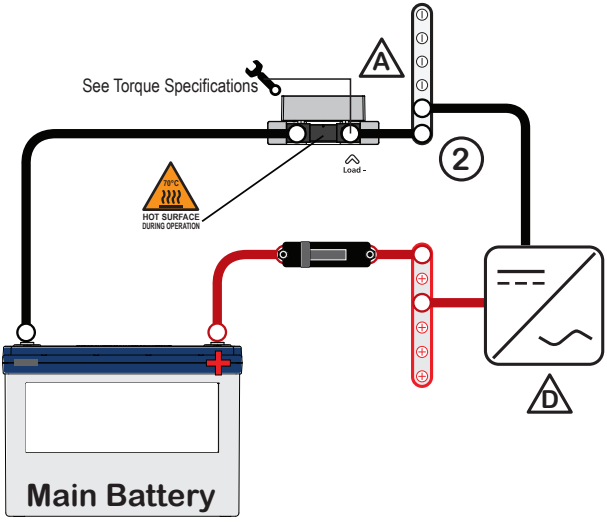
A: Charger/Load system negative (–) Busbar

B: Charger/Load system positive (+) Busbar

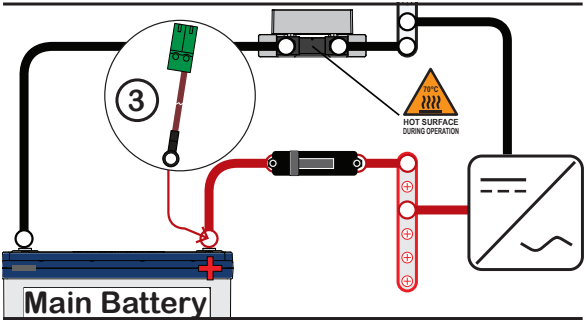
C: Battery cable with DC fuse and/or breaker

D: Charger/Load

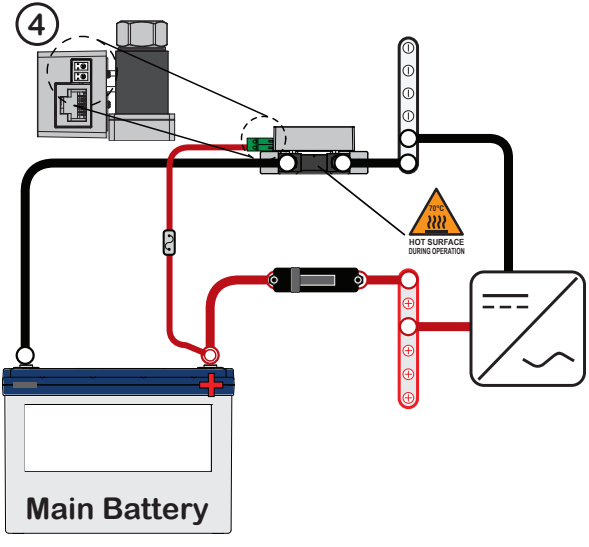
2: Connect the DC cables from XanLink's **Load -** terminal to **A** and from **A** to **D**.



TORQUE Specifications	Nm	inch-lbs
M10 Bolt on XanLink	**26 – 29**	**230 – 256**
NOTE: For all other torque settings, see the battery manufacturer's torque specifications.		



3: Take the Main battery sensing cable (provided) and connect the ring terminal to the positive(+) terminal on the Main battery.



4: Connect the Main battery sensing cable connector to the XanLink's 2-pin port.

⚠ If you are setting up a starting battery, skip this step and continue to *Optional Installation - Starter Battery*.

Monitoring the Main Battery

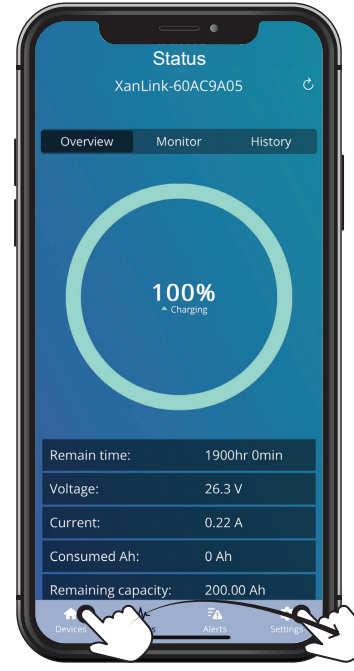
The XanLink™ Battery Monitor enables real-time monitoring of the Main battery's performance, providing insights into the state of charge (SOC), real-time voltage and current, remaining usage time, capacity, protection alarms, and more.
Follow the steps below to set up and configure the monitoring system:

Connecting to the Xantrex App

Available on the App Store

GET IT ON Google Play

1. Download and install the Xantrex App on your mobile device.
2. Pair XanLink with the Xantrex App via Bluetooth.
3. When prompted with a pairing request, enter the pairing code: "*123456*".
4. Tap **Devices**, select the XanLink. The Status screen (shown on the right) appears.
5. Tap the **Settings** page.
6. If you have not done so already from the Quickstart Guide, configure the Main battery system parameters first. Proceed to *Configuring the Main Battery*.



Configuring the Main Battery

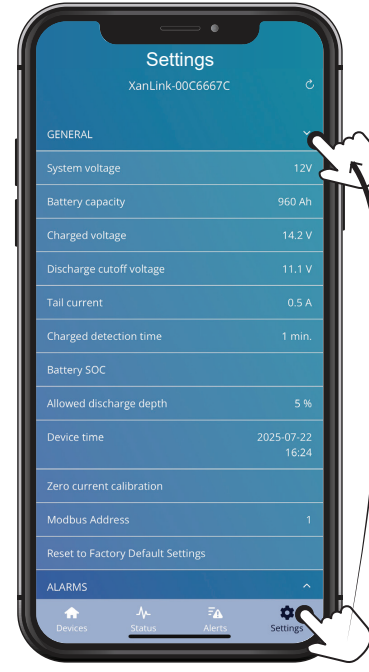
- Set the **System Voltage**, **Battery Capacity**, **Charged Voltage**, **Discharge Cut-off Voltage** and **Device Time*** in the app to match the battery specifications using the table below.
- The table is for reference only. Be sure to adjust according to the battery manufacturer's specifications.

System Voltage	Lead-acid battery Charged Voltage	Lead-acid battery Discharge Cut-off Voltage	Lithium battery Charged Voltage	Lithium battery Discharge Cut-off Voltage
12V	13.5V	11.1V	13.5V	11.1V
24V	27.0V	22.2V	27.0V	22.2V
36V	40.5V	33.3V	40.5V	33.3V
48V	54.0V	44.4V	54.0V	44.4V

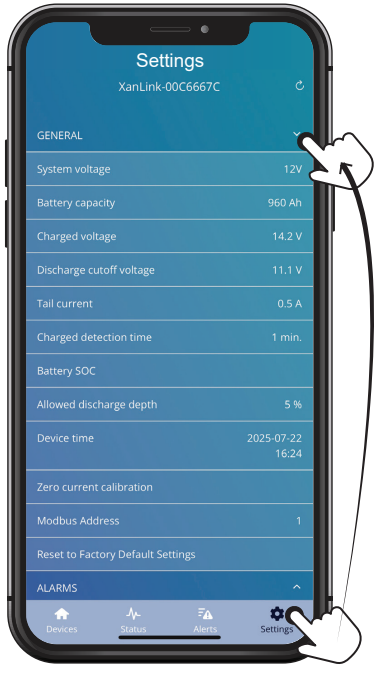
Parameter Configuration

Set these other parameters in the Xantrex App to optimize performance:

- **System voltage**: Input the system voltage that corresponds to the battery voltage used in the network.
- **Battery capacity**: The voltage of the battery when it is considered fully charged. The recommended value is 0.2V below the voltage in the float stage.
- **Charged voltage**: Set the upper voltage limit based on the battery type.
- **Discharge cutoff voltage**: The minimum voltage at which the battery would stop discharging to prevent damage and degradation. The recommended value is 0.2V above the discharge cut-off value per the battery specification.
- **Tail current**: This is the value the charging current has dropped to or below when the battery is considered fully charged.
- **Charged detection time**: The time it takes for the charged voltage and tail current conditions to be met so that the battery is considered fully charged.
- **Battery SOC**: If the SOC is known, manually input the current value for accurate monitoring. If not set, the monitor will update automatically using its internal algorithm.



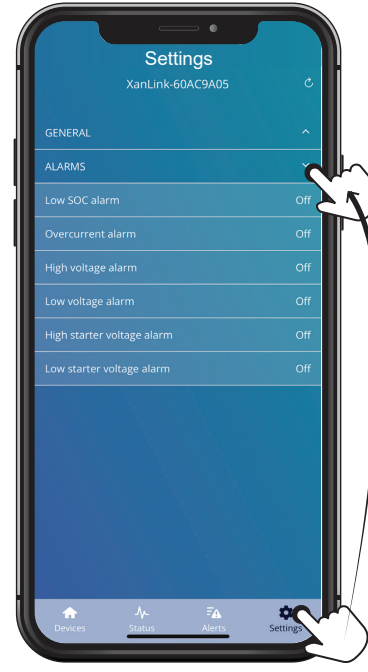
- **Allowed discharge depth**: This value will be used as the lower limit when estimating the remaining usage time based on your current battery level and power consumption. The default value is suitable for most lithium batteries. For lead-acid batteries it's usually set to 50%. Check with your battery specification for appropriate setting.
- **Device time**: Sync device time with your smart phone.
- **Zero current calibration**: ⚠ Use with care. Re-calibration is rarely needed. Disconnect the **Load -** terminal and perform calibration to record the current value as zero.
- **Modbus Address**: The Modbus Address allows a device to be uniquely identified on Modbus. This value is also used as the RV-C device instance on the CAN bus.
- **Reset to Factory Default Settings**: Reset all settings back to factory default. This also clears historical data on this device.



Alarm Settings

Configure alarms to enhance battery protection and ensure system reliability:

- **Low SOC alarm**: Activates when SOC drops below the set value and clears when it recovers above the set threshold.
- **Overcurrent alarm**: Triggers when charge/discharge current exceeds the set value and clears when it falls back within limits.
- **High voltage alarm** (for the Main battery): Activates if voltage exceeds the set value and clears when voltage drops below the threshold.
- **Low voltage alarm** (for the Main battery): Triggers when voltage drops below the set value and clears when it recovers above the threshold.
- **High starter voltage alarm**: Turns on if the Starter battery voltage exceeds the set value and clears when it falls back.
- **Low starter voltage alarm**: Activates if the Starter battery voltage drops below the set value and clears when it rises above the threshold.



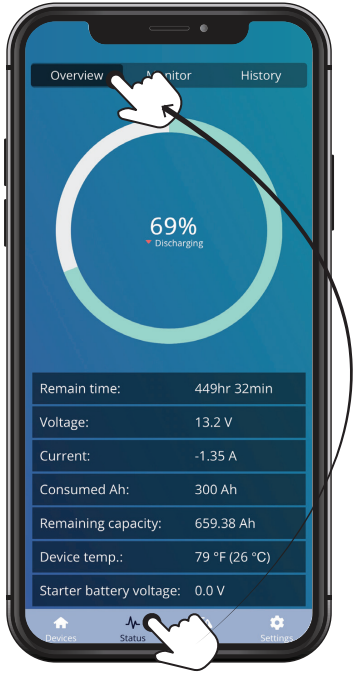
Viewing Status Overview

The Overview tab under the Status screen displays informational battery system data, helping you keep watch of your battery and energy needs.

1. Tap **Status**.
2. Tap **Overview**.

Overview shows the following data:

- **Remain time**: Estimated time until the battery is fully discharged, in hours and minutes.
- **Voltage**: Battery's electrical potential, in volts (V).
- **Current**: Rate of charge/discharge, in amperes (A).
- **Consumed Ah**: Total charge used, in ampere-hours (Ah).
- **Remaining capacity**: Available charge, in ampere-hours (Ah).
- **Device temp**: Battery monitor temperature, in °F and °C.
- **Starter battery voltage**: Voltage of secondary battery used to start engines or power auxiliary systems, in volts (V).



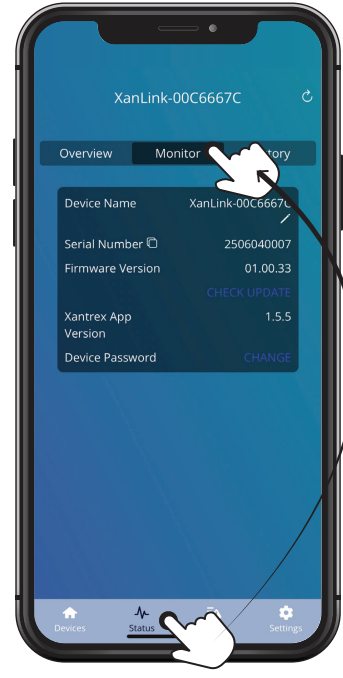
Viewing Status Monitor

The Monitor tab under the Status screen displays XanLink-specific data, allowing you to change certain device parameters which helps customize your XanLink.

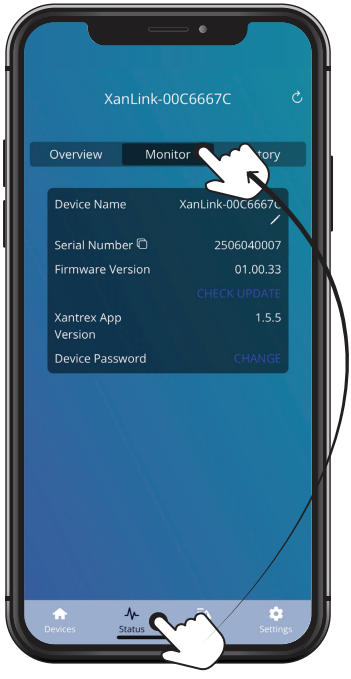
1. Tap **Status**.
2. Tap **Monitor**.

Monitor displays the following device parameters:

- **Device Name**: A customizable identifier for the XanLink, allowing you to assign a unique name (e.g., "Main Battery" or "RV Bank") for easy recognition. See *Changing Device Name*.
- **Serial Number**: A unique, non-editable identifier assigned at the factory, which can be copied for registration, support, or warranty purposes.
- **Firmware Version**: The current software version running on XanLink, which you can update to improve functionality, fix bugs, or add features. See *Updating Firmware*.
- **Xantrex App Version**: The current version of the Xantrex app. To ensure compatibility and access to the latest features for monitoring and configuration, update it from your smart device.

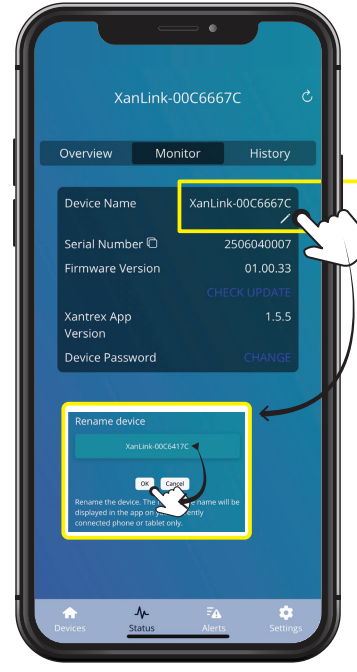


- **Device Password**: A user-modifiable password that protects access to the battery monitor's settings or data, ensuring only authorized users can make changes via the app. See *Changing Device Password for the First Time*. See also *Resetting the Device Password*.



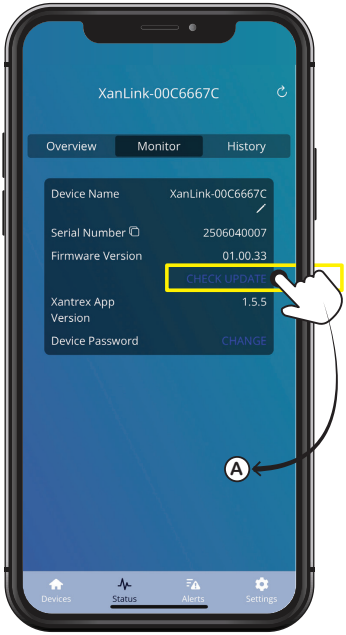
Changing Device Name

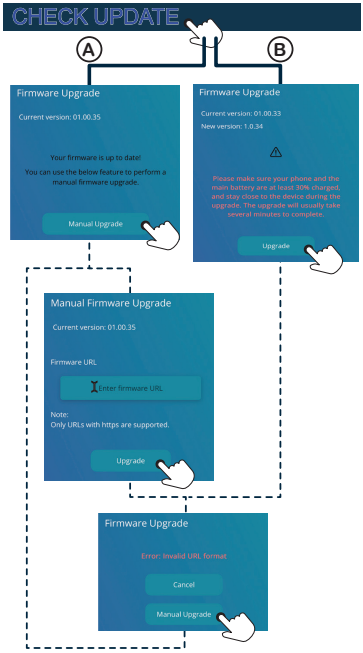
1. Tap **Pencil icon**.
2. Enter a new device name (e.g., "Main Battery" or "RV Bank").
3. Tap **OK**.



Updating Firmware

1. Tap **CHECK UPDATE**.
   If the Firmware is up-to-date then you will get a message as shown below **(A)**. If not, then you will be prompted to upgrade the firmware **(B)**. When you tap the **Upgrade** button, the device firmware will be updated accordingly.
   If you tap the **Manual Upgrade** button then you will be prompted to provide the **URL** where the upgrade file is located.
2. Tap **Upgrade**.

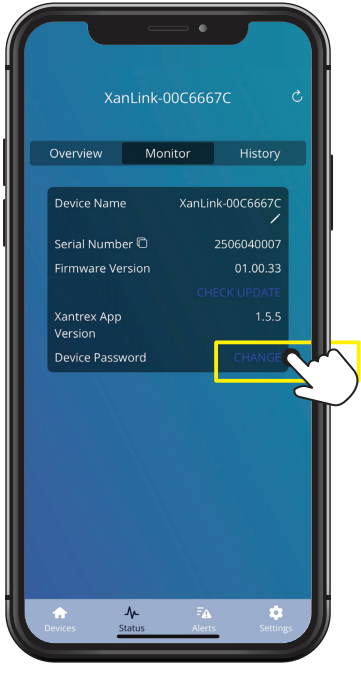


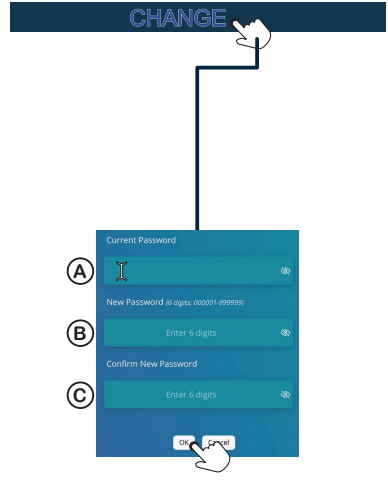


Changing Device Password for the First Time

⚠ Factory default password is "123456". If you forget your new password, you can reset the device password using a unique key. See *Resetting the Device Password* for instructions.

1. Tap **CHANGE**.
2. Enter the (default) old password (A). Enter a new six-digit password (B). Re-enter the new password (C).
3. Tap **OK**.

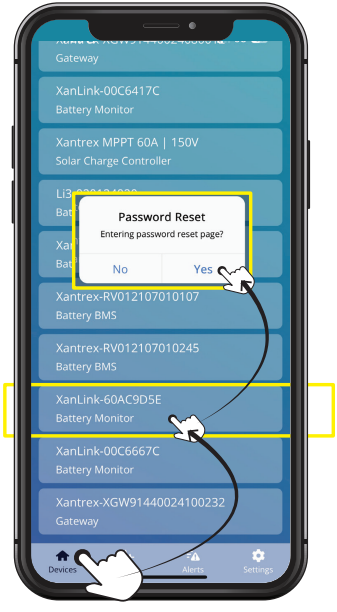


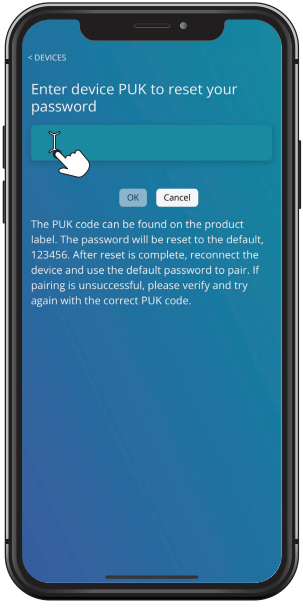


Resetting the Device Password

⚠ The PUK (personal unblocking key) is a unique code printed on a label on the XanLink itself.

1. Tap **Devices**.
2. Tap and hold the particular XanLink from the device list.
3. Tap **Yes**.
4. Enter the device PUK to reset your password.
5. Tap **OK**.





Analyzing Battery Historical Data

The History tab under the Status screen displays historical battery data, helping you manage your battery and energy needs more effectively.

1. Tap **Status**.
2. Tap **History**.

History is divided into four sections.

- **Data Metrics**: You can choose different parameters to display and analyze. See *Chart Types*.
- **Range**: You can choose between the **last 7 days** or the **last 30 days** of accumulated data.
- **Chart** Displays the chart plotted according to the Data Metrics and Range.
- **Summary** Displays six data categories that sums up the following: Total discharged energy (in kWh and Ah), total charged energy (in kWh and Ah), total running days, total charge cycles, number of full discharges, and synchronizations.



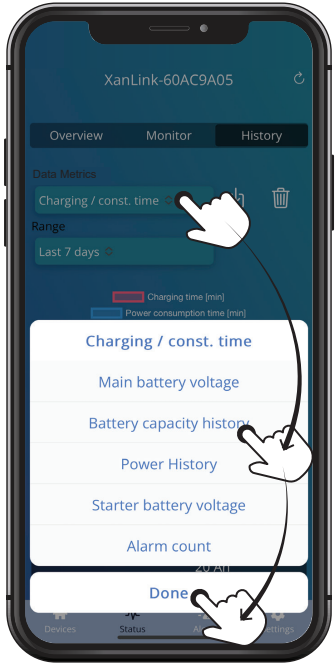
Chart Types

To plot and display a chart:

1. Tap the **Data Metrics** pulldown menu.
2. Tap your selected Data Metrics.
3. Tap **DONE**.

There are six chart types:

- **Charging versus consumption time**: Displays the balance between battery charging input and consumption over time to track energy usage efficiency.
- **Main battery voltage** : Provides a real-time view of the voltage level of the Main battery, indicating its charge status and overall health.
- **Battery capacity** (for the Main battery): Shows the remaining capacity of the battery in kWh, helping to monitor battery life and expected runtime.
- **Power History** (for the Main battery): Tracks power consumption and charging trends over a specific period, offering insights into usage patterns and energy management
- **Starter battery voltage**: Provides a real-time view of the voltage level of the Starter battery, indicating its charge status and overall health
- **Alarm count**: Records the number of alarms triggered due to system events, such as low voltage or over-temperature conditions, aiding in troubleshooting and maintenance.



Downloading Data Sets

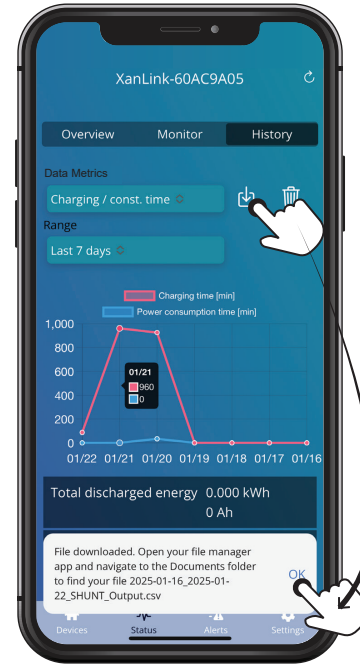
Each Chart type can be downloaded in **.csv* format and stored in your smart device's file system.

1. Tap the **File download** icon. A copy of the file will be saved in your smart device's storage under an internal file folder called Xantrex App.
2. Tap **OK**.

You can also delete the file that corresponds to a Chart type in order to start fresh or to free up storage.

- Tap the garbage icon to delete a Chart type data file.

⚠ Deleted files cannot be recovered.



Optional Installation

Starter Battery

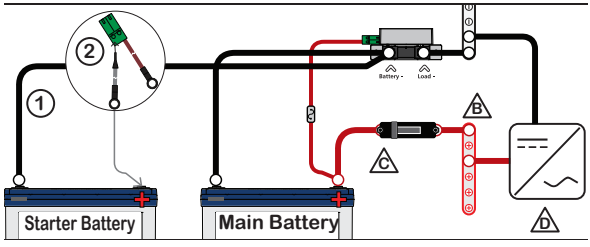
⚠ These steps are applicable only if you have a Starter battery setup.

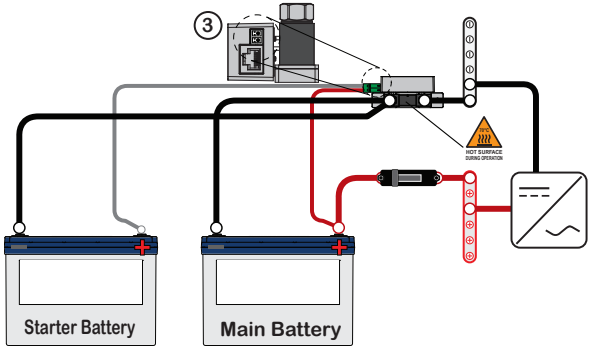
1: Connect a battery cable from the Starter battery's negative(–) terminal to the XanLink's **Battery -** terminal.

2: Connect the Starter battery sensing cable (16AWG) to the left side terminal of the 2-pin connector (of the Main battery sensing cable).

Connect the ring terminal end to the positive(+) terminal on the Starter battery.

3: Connect the 2-pin connector to the XanLink's 2-pin port.





Monitoring the Main Battery and Starter Battery

This application expands the functionality of the XanLink by adding starting battery voltage monitoring alongside Main battery monitoring.

Wiring Instructions

Follow the instructions on *Optional Installation - Starter Battery*.

Parameter Configuration

Use the Xantrex App to configure the necessary settings for both the Main and Starter batteries, following the steps outlined in *Connecting to the Xantrex App on page 11*.

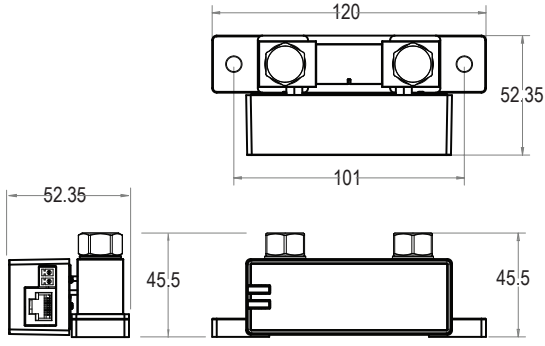
FAQ

XanLink’s indicator light does not turn on. What should I check?	Verify that the positive and negative terminals of the battery and DC system are connected correctly. Ensure the Battery - terminal on the XanLink is securely connected to the battery's positive terminal.
Why is the state of charge (SOC) reading inaccurate or deviates significantly?	Check that XanLink's parameter settings are configured correctly. Ensure the system has undergone a full charge-to-discharge cycle, down to the discharge cut-off voltage, to allow accurate SOC calibration.
Why does the remaining usage time vary greatly?	Confirm that parameters, such as the discharge depth, are correctly configured in the XanLink.
Why is the SOC reading for a lithium battery inaccurate?	Check if the lithium battery has an internal Battery Management System (BMS) with charge and discharge protection features.
When fully charged, why does the battery’s remaining capacity differ from its nominal capacity?	This may be due to the charging/discharging characteristics of the battery, natural capacity attenuation, or other factors. The XanLink’s self-learning algorithm updates capacity estimates based on these conditions over time.

Specifications

NOTE: Specifications are subject to change without prior notice.

Feature	XanLink™ Battery Monitor
Product Numbers	XanLink RV-C (PN: 854-2033)
Supported Battery Types	Sealed lead-acid, gel, flooded, and lithium batteries
Supply Voltage	6.5 to 60 V⎓
Current	500A
DC System Voltage	12 | 24 | 36 | 48 V
Battery Capacity	1 to 9999 Ah
Static Power	≤15mA
RS-485	9600 bps, 8, 1, None, the default baud rate 9600 bps
Bluetooth	Built-in Bluetooth: Supports Xantrex App data interaction and over-the-air (OTA) firmware upgrades
CAN	RV-C
Ingress Protection	IP21 (PN: 854-2033)
Operating Temperature	-35 to 65 °C

Dimensions (in mm)	
Weight	0.35 kg
Safety	UL 62368-1 CSA C22.2 No. 62368-1 Regulation (EU) 2023/988 LVD Directive 2014/35/EU
EMI/EMC	Directive 2014/30/EU FCC PART 15 Subpart C (47 CFR) ISED Canada RSS-Gen Issue 5 / RSS-247 Issue 3