

---

# Installation in a Positive-grounded Battery System

Technical Note

**Xantrex™ XW Series  
Solar Charge  
Controller**

**976-0262-01-01 Rev. A**

---

THIS TECHNICAL NOTE IS IN ADDITION TO, AND INCORPORATES BY REFERENCE, THE RELEVANT PRODUCT MANUALS FOR THE SCHNEIDER ELECTRIC XANTREX XW SERIES SOLAR CHARGE CONTROLLER. BEFORE REVIEWING THIS TECHNICAL NOTE YOU MUST READ THE PRODUCT MANUALS.

This Technical Note provides the procedure for installing the Xantrex XW Series Solar Charge Controller in applications that require a negative voltage reference, such as in telecom applications where the voltage reference is -48 V.

## Overview

The Solar Charge Controller's internal design has a built-in fuse—rated at 1 A, 600 V—which grounds both the PV negative and battery negative conductors and provides PV ground-fault protection (PVGFP) to the system. To avoid a short circuit, ground fault protection must be disabled before grounding the positive battery terminal for negative voltage reference. Disabling the PVGFP circuit in this way opens the negative-to-ground bond within the unit, allowing for a positive battery ground connection. If PVGFP is required, install an external protection circuit that is compatible with a positive-grounded battery system.

### **DANGER**

#### **HAZARD OF ELECTRIC SHOCK AND FIRE**

PV array terminals and auxiliary terminals must not be grounded in the installed system.

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

Because there is no isolation between the battery and the PV array, this positive-grounded battery configuration will bias the PV array terminals and the internal auxiliary lines to -Batt V with respect to chassis ground. For example, using a 150 VOC PV array and a 60 V battery bank, grounding the positive battery terminal will make PV(-) sit at -60 V and PV(+) at +90 V. Aux(-) will be biased at -60 V and Aux(+) at +45 V. These voltage levels on both battery and auxiliary outputs are considered safe, extra-low voltages and do not present a hazard as long as the PV terminals are kept floated or ungrounded.

Follow the instructions in the Solar Charge Controller owner's manual for connecting the PV array and battery to the unit. Next, follow these steps for a safe, negative voltage reference connection:

1. Disable the Solar Charge Controller's internal PVGFP circuit. See "Disabling the Solar Charge Controller's Internal PVGFP Circuit" on page 2.
2. Make sure PV array terminals (positive and negative) are ungrounded.
3. Make sure auxiliary terminal lines (positive and negative) are ungrounded.
4. Ground the positive terminal of the battery only.

## Disabling the Solar Charge Controller's Internal PVGFP Circuit

Before grounding the positive battery terminal to obtain a negative reference voltage, you must disable the Solar Charge Controller's internal PVGFP circuit.

### **DANGER**

#### **HAZARD OF ELECTRIC SHOCK**

Disconnect PV and battery circuits before accessing the Solar Charge Controller's wiring compartment.

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

To disable the PVGFP circuit, remove the small jumper connector located on the circuit board within the wiring compartment of the unit. See Figure 1 for the jumper location. After removal, the jumper can be stored on a single pin of the 2 pin connector or moved into the location marked for units with a 3-pin connector.

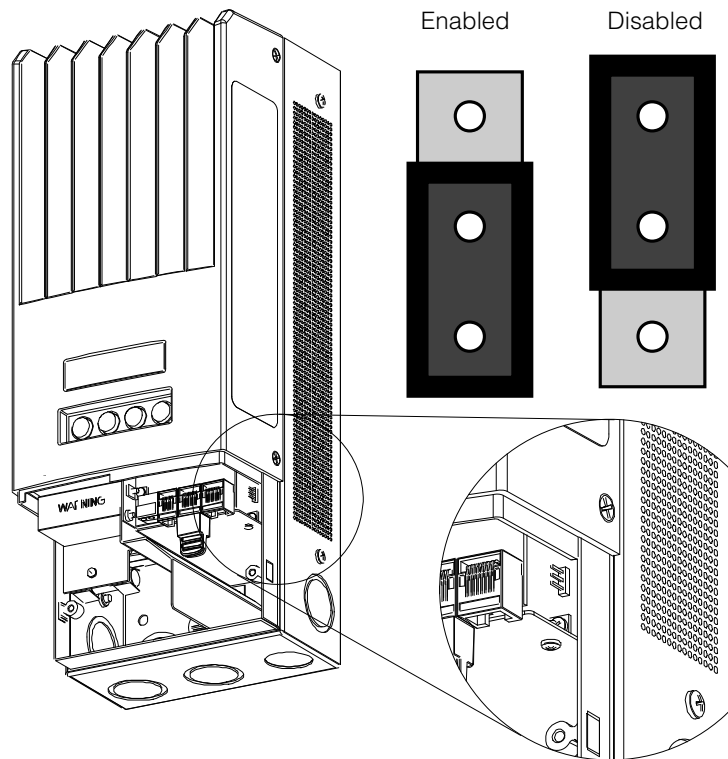


Figure 1 Jumper Location (CE Marked Model)

## PV Connection and Auxiliary Lines

### **⚠ WARNING**

#### **HAZARD OF FIRE**

Do not ground the negative conductor of the auxiliary circuit.

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

The PV array must not be grounded in either its positive or negative terminal. Do not attempt to ground the PV+ terminal to have a common ground with the battery. A positive ground connection at the PV array will bias both battery and auxiliary terminals to -PV voltage with respect to chassis ground. This will present shock hazardous voltages at the battery terminals and the auxiliary lines.

The internal auxiliary connector lines must not be grounded in either their positive or negative terminal. Grounding the negative terminal of the auxiliary lines will create a short on the battery side outside the reach of the unit's over-current protection.

**Schneider Electric**, the **Schneider Electric logo**, and **Xantrex** are trademarks or registered trademarks of the Schneider Electric group of companies. Other trademarks, registered trademarks, and product names are the property of their respective owners and are used herein for identification purposes only.  
 Copyright © October 2010 Xantrex Technology Inc. All rights reserved. No part of this document may be reproduced in any form or disclosed to third parties without the express written consent of:  
 Xantrex Technology Inc. 161-G South Vasco Road Livermore, California USA 94551  
 Xantrex Technology Inc. reserves the right to revise this document and to periodically make changes to the content hereof without obligation or organization of such revisions or changes unless required to do so by prior arrangement.  
 All warranty, disclaimer and safety information is contained within the primary documentation received with the unit. Unless specified, safety, installation, operation and specification information is as shown in the primary documentation. Ensure you are familiar with that information before proceeding.

**Exclusion for Documentation**

UNLESS SPECIFICALLY AGREED TO IN WRITING, XANTREX TECHNOLOGY INC. ("XANTREX")  
 (A) MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN ITS MANUALS OR OTHER DOCUMENTATION;  
 (B) ASSUMES NO RESPONSIBILITY OR LIABILITY FOR LOSSES, DAMAGES, COSTS OR EXPENSES, WHETHER SPECIAL, DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL, WHICH MIGHT ARISE OUT OF THE USE OF SUCH INFORMATION. THE USE OF ANY SUCH INFORMATION WILL BE ENTIRELY AT THE USER'S RISK; AND  
 (C) REMINDS YOU THAT IF THIS DOCUMENTATION IS IN ANY LANGUAGE OTHER THAN ENGLISH, ALTHOUGH STEPS HAVE BEEN TAKEN TO MAINTAIN THE ACCURACY OF THE TRANSLATION, THE ACCURACY CANNOT BE GUARANTEED. APPROVED XANTREX CONTENT IS CONTAINED WITH THE ENGLISH LANGUAGE VERSION WHICH IS POSTED AT [www.schneider-electric.com](http://www.schneider-electric.com).

**Date and Revision**

October 2010 Rev. A    **Part Number** 976-0262-01-01

**Contact Information**

[www.schneider-electric.com](http://www.schneider-electric.com)

			
North America	1 650 351 8237 1 866 519 1470 3-phase 1 408 987 6255	1 925 245 1022	<a href="mailto:re.techsupport@schneider-electric.com">re.techsupport@schneider-electric.com</a>
France	0 825 012 999		<a href="mailto:fr-re-techsupport@fr.schneider-electric.com">fr-re-techsupport@fr.schneider-electric.com</a>
Deutschland	+49 (0) 180 575 3 575	+49 (0) 2102 404 7101	<a href="mailto:pv-service@de.schneider-electric.com">pv-service@de.schneider-electric.com</a>
España	+34 93 498 7466	+34 93 305 5026	<a href="mailto:re.techsupport@es.schneider-electric.com">re.techsupport@es.schneider-electric.com</a>
Italia	+39 035 4151111	+39 035415 3200	<a href="mailto:IT-pronto-contatto@it.schneider-electric.com">IT-pronto-contatto@it.schneider-electric.com</a>

For other country details please contact your local Schneider Electric Sales Representative or visit our website at:  
<http://www.schneider-electric.com/sites/corporate/en/support/operations/local-operations/local-operations.page>