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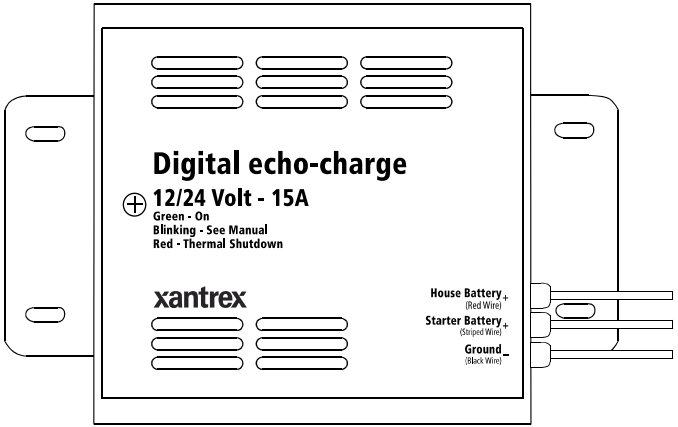


**Owner's Guide**

# Xantrex Digital echo~charge Battery Charger

**Model Product Number**
**82-0123-01**

## Exclusion for Documentation

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## Document Part Number

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## Date and Revision

September 2015 Rev B

## Product Number

82-0123-01

## Contact Information

Telephone: +1 800 670 0707
+1 408 987 6030

Web: www.xantrex.com

## Information About Your System

As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number _____

Product Number _____

Purchased From _____

Purchase Date _____

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# Important Safety Instructions

## **IMPORTANT:** READ AND SAVE THIS OWNER'S GUIDE FOR FUTURE REFERENCE.

This guide contains important safety instructions for the Xantrex Digital echo~charge that must be followed during operation and troubleshooting. **Read and keep this Owner's Guide for future reference.**

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**⚠⚠DANGER**

**DANGER** indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

**⚠WARNING**

**WARNING** indicates a potentially hazardous situation, which, if not avoided, can result in death or serious injury.

**⚠CAUTION**

**CAUTION** indicates a potentially hazardous situation, which, if not avoided, can result in moderate or minor injury.

***NOTICE***

**NOTICE** indicates a potentially hazardous situation, which, if not avoided, can result in equipment damage.

**Important:** These notes describe things which are important for you to know, however, they are not as serious as a caution or warning.

# Safety Information

1. **Before using the Digital echo~charge (the unit), read all instructions and cautionary markings on the unit, the batteries, and all appropriate sections of this manual.**
2. Use of accessories not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
3. The unit is designed to be connected to your DC electrical system. The manufacturer recommends that all wiring be done by a certified technician or electrician to ensure adherence to the local and national electrical codes applicable in your jurisdiction.
4. To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the unit with damaged or substandard wiring.
5. Do not operate the unit if it has been damaged in any way.
6. This unit does not have any user-serviceable parts. Do not disassemble the unit except where noted for connecting wiring and cabling. See your warranty for instructions on obtaining service. Attempting to service the unit yourself may result in a risk of electrical shock or fire.
7. To reduce the risk of electrical shock, disconnect DC power from the unit before attempting any maintenance or cleaning or working on any components connected to the unit.
8. Do not expose this unit to rain, snow, or liquids of any type. This product is designed for indoor use only. Damp environments will significantly shorten the life of this product and corrosion caused by dampness will not be covered by the product warranty.
9. To reduce the chance of short-circuits, always use insulated tools when installing or working with this equipment.
10. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with electrical equipment.

**⚠⚠DANGER**

**ELECTRICAL SHOCK AND FIRE HAZARD**

Installation must be done by qualified personnel to ensure compliance with all applicable installation and electrical codes and regulations. Instructions for installing the Xantrex Digital echo~charge are provided here for use by qualified personnel only.

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

# Contents

# Introduction

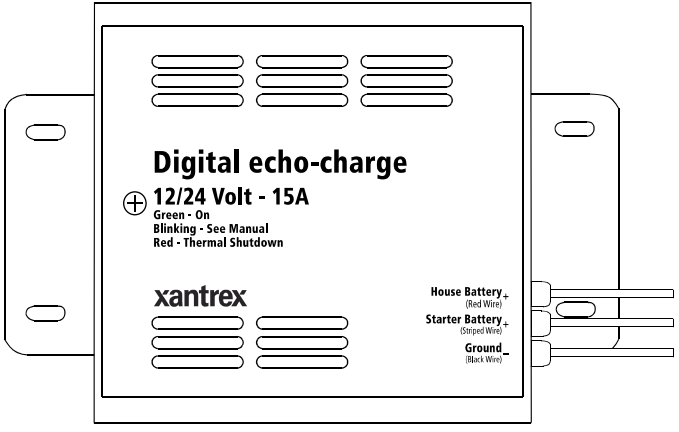
Thank you for purchasing a Xantrex Digital echo~charge.

The Digital echo~charge is designed to operate with any DC charging source to charge the starter or auxiliary battery.

The Digital echo~charge is specially developed for charging an auxiliary battery from any charging source. The Digital echo~charge automatically switches ON and OFF, charging a starter or auxiliary battery without affecting the main house battery bank. The maximum charge current is 15 amps when the starting battery is ½ volt to 1 volt DC less than the house battery. The Digital echo~charge is designed to work on 12 VDC or 24 VDC systems.

The Digital echo~charge is a voltage-follower. If using a three-stage charge source, the Digital echo~charge will follow the charge stages of the charge source. Refer to the charge source's Owner's Manual for charge modes.

For technical support and additional information about other Xantrex-branded products, visit our Web site at www.xantrex.com or contact Xantrex via the contact information on page i.




- 16 gauge wire with ring terminal (quantity 1)
- 16 gauge wire with ring terminal and 20 amp in-line fuse (quantity 2)
- Digital echo~charge Owner's Guide

**Figure 1** What's In the Box

# Key Things To Know

- Use only deep-cycle batteries in your house battery bank.
- Only similar batteries should be connected together in one bank. Do not connect old and new batteries together or wet and gel cell batteries together.
- Always use properly sized terminals and cables for your interconnecting battery cables.
- Starter battery and house battery banks should not be mixed in the same bank.

# Installation

## Before You Begin

The Digital echo~charge should be unpacked immediately upon receipt, and inspected to determine if any shipping damage has occurred. No special handling is necessary; however, care should be used to avoid dropping the unit or exposing it to dust and moisture.

### Needed for Installation

- Flat head and Phillips screwdrivers
- Wire cutters
- Wire strippers
- Mounting screws
- #12 gauge wire, if an extension is needed
- Miscellaneous assortment of wire ties and connectors

## Installation Precautions

**⚠CAUTION**

**ELECTRICAL SHOCK HAZARD**

Do not mount where exposed to rain, drip or spray.

**Failure to follow these instructions can result in minor or moderate injury.**

**⚠CAUTION**

**ELECTRICAL SHOCK HAZARD**

Do not remove cover. No user serviceable parts inside.

**Failure to follow these instructions can result in minor or moderate injury.**

**⚠CAUTION**

**PHYSICAL AND CHEMICAL HAZARD**

- Always wear safety glasses for eye protection when working with batteries.
- Protect your skin from harm by wearing clothing that will cover your arms and legs when working with batteries.

**Failure to follow these instructions can result in minor or moderate injury.**

The Digital echo~charge is intended for vertical mounting but can be mounted horizontally.

Mount the Digital echo~charge in a location that provides the greatest convenience when making the wire connections to the batteries.

Select a location that is within two feet of the house battery and within two feet of the starter battery, for maximum charging current.

Mount the unit using the holes on the flanges. Ensure that the mounting location is well ventilated and not exposed to harsh environments of dust and moisture or in the presence of flammable fumes. Do not mount on carpet or other heat-sensitive surfaces.

Before making any connections, remove all charging sources—disconnect from shorepower, turn the generator OFF and do NOT run the engine. No charging voltage should be present during installation. Follow the manufacturer's instructions for disabling your charging sources before beginning installation.

## Battery Connections

***NOTICE***

**EQUIPMENT DAMAGE**

Make sure all charging sources are switched OFF and no charging voltage is present before beginning installation.

**Failure to follow these instructions can damage other equipment.**

***NOTICE***

**REVERSE POLARITY DAMAGE**

Check cable polarity at both the battery and the Digital echo~charge before making the final DC connection. Positive must be connected to positive; negative must be connected to negative.

Reversing the positive and negative battery cables will damage the Digital echo~charge and void the warranty.

**Failure to follow these instructions can damage the unit.**

Two feet of 16 gauge wire with a ring terminal on the end is connected to the Digital echo~charge unit. Connect the ring terminals to the batteries as indicated in Figure 2.

**Connect from the Digital echo~charge:**

1. Ground wire (black) to the negative battery (negative or load side of shunt if a battery monitor is used).

2. Starter Battery wire (red with yellow trace) to the starter battery positive (+ red) terminal. A 20 amp fuse in this line protects the wire.
3. House Battery wire (+ red) to the house battery bank positive (+ red) terminal. A 20 amp fuse in this line protects the wire.

Use 12 gauge wire to extend wire if needed. Avoid using long connection wires. The longer the wires, the less current will flow and the longer it will take to charge the starter battery.

After all connections have been made, turn the battery charger ON. When the house bank exceeds 13.0 VDC (26.0 VDC for 24 VDC configurations) the Digital echo~charge will begin to charge the starter battery.

**NOTE:** If the house bank exceeds 13.0 VDC or 26.0 VDC and the House Battery Positive and Ground connections have been made, the Digital echo~charge's indicator light will be Green. When the starter battery connection is made, charging will begin.

**⚠WARNING**

**ELECTRICAL SHOCK HAZARD**

Never disconnect battery cables while the charger is in operation.

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

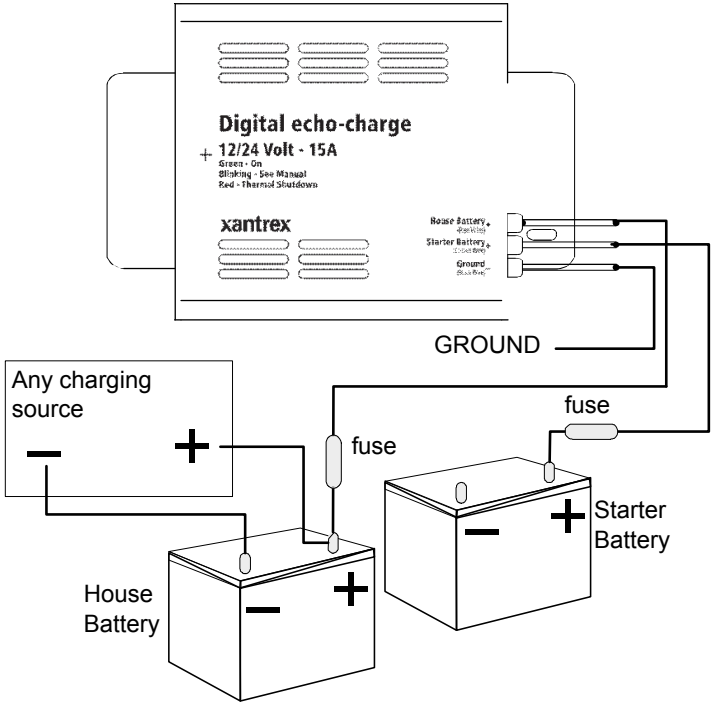



**Figure 2** Installation Diagram

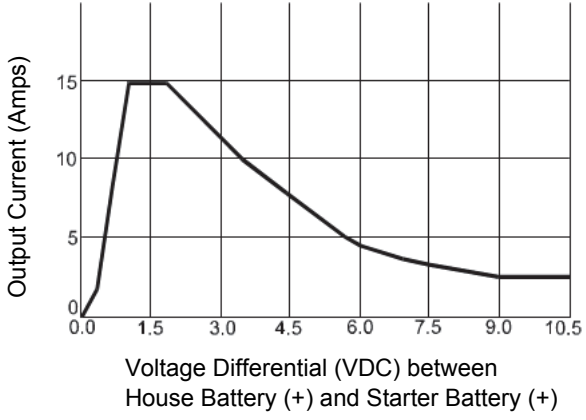
When the input voltage is 13.0/26.0 volts DC or higher, Digital echo~charge automatically switches ON. The indictor light glows a steady green.

When the input voltage is lower than 13.0/26.0 volts, the Digital echo~charge automatically switches OFF, and the indictor light blinks green.

The output voltage of Digital echo~charge is limited to 14.4/28.8 volts. When the Digital echo~charge output reaches 14.4/28.8 volts, the charge current will decrease, maintaining a float condition. The starter battery will be fully charged without overcharging.

When the Digital echo~charge is OFF, it draws less than 50 milli-amps from the house bank.

If the input voltage to the Digital echo~charge is above 14.4 volts (or 28.8 for 24V configurations), the Digital echo~charge output will be limited to a maximum of 14.4/28.8 volts.




The graph shows the relationship between the voltage difference over the Digital echo~charge (voltage difference between house (+) and starter (+) battery) and the charge current.

**Figure 3** Voltage Differential

# Operation

It is important to install the Digital echo~charge in a well-ventilated location. An elevated temperature may cause the Operation indicator light to glow red and turn the Digital echo~charge OFF. Once the over-temperature condition is corrected, the Digital echo~charge will resume normal operation.

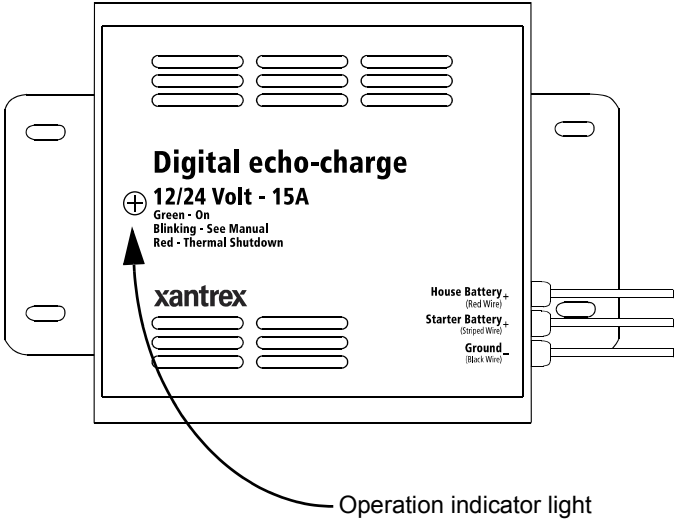



**Figure 4** Operation

# Troubleshooting

**Table 1** Troubleshooting

| Problem | Things to Check |
|---|---|
| LED is red. Thermal shutdown | 1. Check to see that the Digital echo-charge has sufficient air flow and ventilation around it.<br>2. Check the battery connections. |
| Starter battery is not charging | 1. Check the difference in voltage between the house battery and the starter battery. If the difference is greater than 2 volts, the Digital echo-charge will reduce the charge current. If the difference is greater than 10 volts, the Digital echo-charge will shut off and the green LED will blink.<br>2. Check the connections to house battery bank and starter battery. Check the fuses. Check the ground connection. |
| LED is off | Check fuse in the red wire. Check the ground connection. |

**Table 1** Troubleshooting

| Problem | Things to Check |
|---|---|
| LED is flashing green | 1. House battery voltage below 13.0 volts DC or above 17 volts DC.<br>2. The difference between the house battery and the starter battery is greater than 10 volts DC. |

LED refers to the indicator light on the Digital echo~charge.

## Fuse Replacement

An in-line fuse is installed in the unit. For continued protection, the fuse must be replaced with a fuse of the same type and rating.

# Glossary

**AGM (Absorbed Glass Mat) Battery** A lead acid, maintenance-free battery.

**Ah Capacity** The ability of a fully charged battery to deliver a specified quantity of electricity (Amp-Hr., Ah) at a given rate (Amp, A) over a definite period of time (Hr.). The capacity of a battery depends on a number of factors: active material, weight, density, adhesion to grid, number, design and dimensions of plates, plate spacing design of separators, specific gravity and quantity of available electrolyte, grid alloys, final limiting voltage, discharge rate, temperature, internal and external resistance, age and life of the battery (bank).

**Alternating Current (AC)** An electric current that reverses direction at regular intervals. Sources of alternating current are shorepower, generator power, inverter power or household current.

**Ampere (Amp, A)** The unit of measure of electron flow rate of current through a circuit.

**Ampere-hour (Amp-Hr., Ah)** A unit of measure for a battery's electrical storage capacity, obtained by multiplying the current in amperes by the time in hours of discharge (Example: a battery that delivers 5 amperes for 20 hours delivers 5 amperes times 20 hours, or 100 Amp-Hr. of capacity.)

**AWG (American Wire Gauge)** A standard used to measure the size of wire.

**Current** The rate of flow of electricity or the movement rate of electrons along a conductor. It is comparable to the flow of a stream of water (in litres per second or gallons per second). The unit of measure for current is ampere.

**Cycle** In a battery, one discharge plus one recharge equals one cycle.

**Direct Current (DC)** Current that flows continuously in one direction such as that from batteries, photovoltaics, chargers and DC generators.

**Gel Cell Battery** A type of battery that uses a gelled electrolyte solution. These batteries are sealed and are virtually maintenance-free. Not all sealed batteries are the gel cell type.

**Ground** The reference potential of a circuit.

**NEC** National Electric Code

**Negative** Designating or pertaining to electrical potential. The negative terminal is the point from which electrons flow during discharge.

**Positive** Designating or pertaining to electrical potential; opposite of negative. The positive battery terminal is the point where electrons return to the battery during discharge.

**Volt** The unit of measure for electric potential.

**Watt** The unit for measuring electrical power, i.e., the rate of doing work, in moving electrons by or against an electric potential.

**Wet Cell Battery** A type of battery that uses liquid as an electrolyte. The wet cell battery requires periodic maintenance; cleaning the connections, checking the electrolyte level and performing an equalization cycle.

# Specifications

**NOTE:** Specifications are subject to change without prior notice.

| Model | 12V | 24V |
|---|---|---|
| Input<br>(House Battery) | | |
| Output ON | 13.0 to 17.0 V | 26.0 to 33.0 V |
| Output OFF | < 12.9 V<br>> 17.0 V | < 25.5 V<br>> 34.0 V |
| Output | | |
| Charge Current | 15.0 A (max) | 15.0 A (max) |
| Reverse Current | 0.0005 A | 0.0015 A |
| Voltage Limiting | 14.4 V | 28.8 V |

## Protection

- Input is not protected against a voltage that is greater than 36 VDC.
- Thermal protection automatically shuts down the Digital echo~charge. When the condition is corrected, the unit will automatically reset.

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