



# 1130/1134 Battery Charger



## User's Guide

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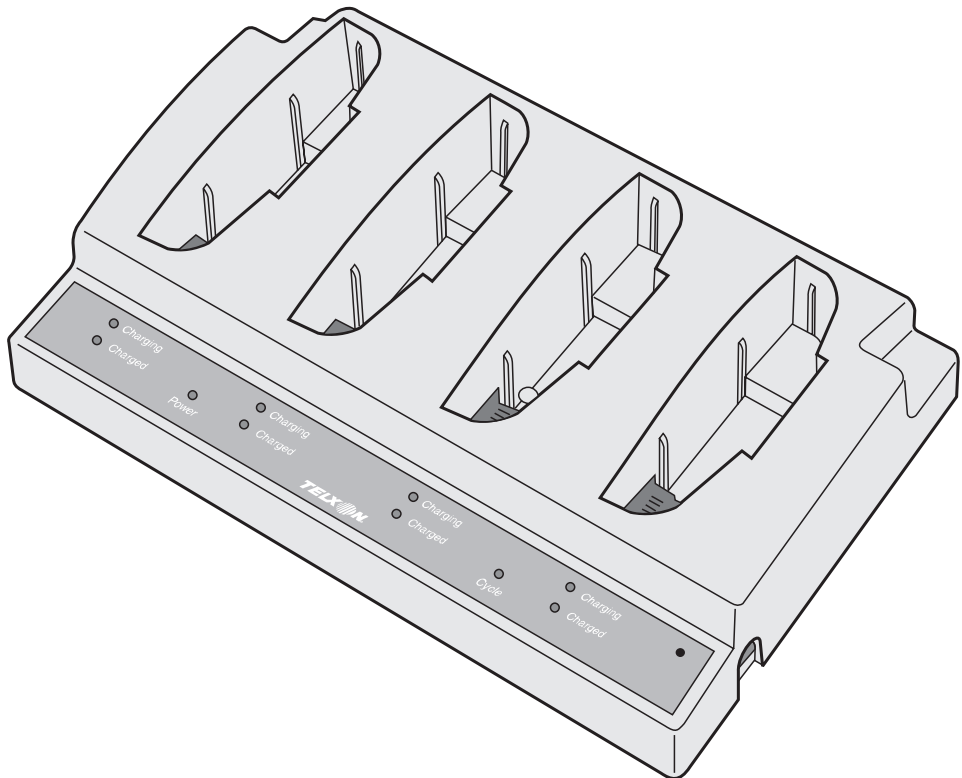
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# 1130/1134 Battery Charger User's Guide





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# Regulations 1

## FCC statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this operator's guide, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

# Safety information 2

## Disposing of nickel-cadmium batteries

Nickel-cadmium batteries contain chemically active materials that are hazardous to the environment; therefore, they must be disposed of properly. Never attempt to incinerate a nickel-cadmium battery; doing so could cause it to explode. Telxon urges you to contact the Environmental Protection Agency, the Department of Natural Resources, a local hazardous waste disposal agency, or the Telxon Customer Support Center for assistance prior to disposing of your nickel-cadmium batteries.

# Scope of the manual 3

This manual provides general information on the 1130/1134 Battery Charger's parts, features, and accessories. It also explains how to operate and maintain the battery charger. It does not cover information specific to your application.

## Document conventions

The following conventions are used throughout this manual.

### Cautions

Cautions indicate potential damage to the equipment. They are set off in the left-hand columns of this manual by the following symbol: !.

### Notes

Notes provide supplementary information. They are set off in the left-hand columns of this manual and are not preceded by a symbol.

# Overview of the battery charger 4

The 1130/1134 Battery Charger is an accessory for the PTC-1130/1134 series of pen-based hand-held computers. These portable computers collect, store, and transmit data.

The battery charger provides a quick way to recharge the battery packs that provide power for all PTC-1130/1134 models. One charger can hold up to four battery packs at a time.

**! Only nickel-cadmium battery packs that have been designed for use in a PTC-1130/1134 model can be recharged by the charger. Do not attempt to recharge other types of rechargeable batteries. Doing so could destroy those batteries and damage the charger.**

The charger recharges a battery pack in 2 hours or less. If more than one battery pack is in the charger, the packs are charged one after another, starting with the pack farthest to the left. If four packs are installed in the charger, the first will be fully charged after no more than 2 hours, and the fourth will be fully charged after no more than 8 hours.

The charger senses when a battery pack is not fully discharged and automatically adjusts the recharge time. For example, a half-charged battery pack will be recharged in one-half the typical recharge time. If a fully charged battery pack is inserted into the battery charger, it will be detected, charging will stop in 5 to 10 minutes, and the charger will go into trickle charge mode.

The charger is also able to detect faulty battery packs and is equipped with a cycling feature that can be used to maintain battery pack life.

The charger draws its power from an external 18-volt, 800-mA AC power pack. The charger is designed to be used while resting on a horizontal surface such as a shelf or table.

# Getting started 5

## Unpacking the 1130/1134 Battery Charger

The 1130/1134 Battery Charger is shipped in a single box containing

- an 1130/1134 Battery Charger,
- a power pack (if ordered),
- an *1130/1134 Battery Charger User's Guide*, and
- a *Guide to Maintaining NiCd Batteries*.

Spare battery packs for the PTC-1130/1134, if ordered, are shipped in a separate box.

1. Unpack the box and save the packaging in case the charger is ever stored or shipped to Telxon for service.
2. Check the contents of the package to make sure you have received everything ordered.
3. Check the charger and accessories for shipping damage.

If anything is missing or damaged, notify your Telxon sales representative.

## Installing the battery charger

### Equipment required:

- A power pack
- An electrical outlet, providing 120 volts AC in the U.S. or Canada, within 6 feet (1.8 meters) of the charger's permanent location

If you are using the charger outside of the U.S. or Canada, you need a power pack designed for a 240-volt outlet.

1. Place the charger on a horizontal surface in a location where the temperature will be between -4 degrees F (-20 degrees C) and 122 degrees F (50 degrees C).
2. Plug the power pack's cable into the power connector on the side of the charger.
3. Plug the power pack into an electrical outlet.

## Running the power-on self test

When you plug in the 1130/1134 Battery Charger, it automatically performs a series of self-diagnostic tests to ensure it is operating correctly. These tests take approximately 10 seconds to complete.

The tests are indicated by flashing patterns of the charger's battery pack slot light-emitting diodes (LEDs). If the charger passes these diagnostics, all the LEDs, except the Power LED, turn off after approximately 10 seconds, provided no battery packs are in the charger.

If any LEDs other than the Power LED remain lit, with no battery packs in the charger, the diagnostic tests have discovered an error. Refer to the "Troubleshooting" section on [page 20](#) for further information.

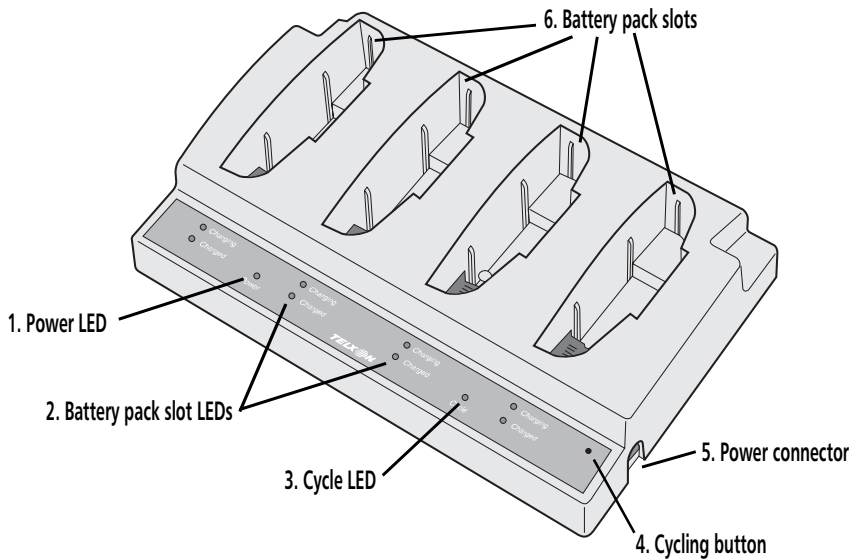
# Parts 6

**Figure 1** shows the parts of the 1130/1134 Battery Charger. The following accessory is not illustrated.

## Power pack

This separate power pack plugs into a standard electrical outlet and provides power to the charger.

Figure 1. 1130/1134 Battery Charger (front view)



1. This red LED glows when the charger is receiving power and is operating.
2. The red Charging LEDs (one below each battery pack slot) glow when the corresponding battery packs are charging. The green Charged LEDs (one below each battery pack slot) glow when the corresponding battery packs are fully charged. Both LEDs blink to indicate an error during the power-on self test or when a faulty battery pack is detected. See [Appendix C](#) for an explanation of the LED codes.
3. This LED glows when the battery packs are being cycled.
4. This button starts the battery pack cycling function. Pressing this button a second time, removing all battery packs from the charger, or disconnecting the power turns off the cycling function.
5. The power pack plugs into this connector.
6. These vertical slots hold the battery packs while they are being recharged.



# Recharging battery packs 7

! Do not attempt to recharge any battery packs other than those designed for the PTC-1130/1134. Doing so could destroy those batteries and damage the charger.

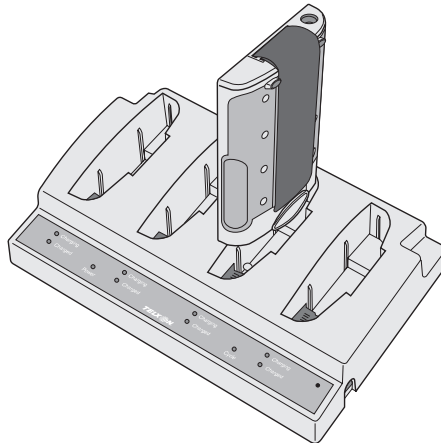
A battery pack can be inserted into any battery pack slot. If it is the only pack installed, the charger will start charging it. If a second pack is inserted to the left of the first pack (while the first pack is being charged), the charger will begin charging the second pack after the first pack has been fully charged. The left-most pack is always the next to be charged.

## Inserting a battery pack

! Recharging a cold battery pack can damage it. Allow any battery pack used in below-freezing temperatures (32 degrees F/0 degrees C or less) to warm up to room temperature before recharging.

1. Hold the battery pack so the flat side is toward the left side of the battery charger and the battery pack contacts face down. See Figure 2.
2. Insert the battery packs, in any order, into the slots. Make sure the battery packs are firmly seated against the bottom of the slots.

Figure 2. Inserting a battery pack



! Do not force a battery pack into a slot. The slots are keyed to allow a battery pack to fit in only one way.

See **Table 2** for an explanation of the LED codes.

The battery pack may grow slightly warmer while it is charging; this is normal.

The battery pack slots are keyed to prevent the battery packs from being inserted with reversed polarity. If a battery pack is inserted incorrectly, it will not slide all the way to the bottom of the slot.

3. Charging begins automatically. The red Charging LED below each slot containing a battery pack lights. Allow approximately 2 hours charging time per battery pack. (A battery pack that is not fully discharged will take less time to charge.)
4. When the green Charged LED below a slot lights, the battery pack is charged and can be removed and used.

See the table on **page 25** for an interpretation of the battery pack slot LEDs.

## Removing a battery pack

Do not remove a battery pack from the charger until the green Charged LED below its slot lights.

Once a battery pack has been charged, it can be removed, regardless of which slot it occupies, and another battery pack can be inserted into this slot.

1. To remove a battery pack, grasp it and then lift it out of the charger.

## Disposing of battery packs

Nickel-cadmium battery packs are hazardous waste. See the “Safety information” section on **page 8** for information on how to properly dispose of them.

# Cycling a battery pack 8

! Cycle battery packs only when necessary. During cycling, each battery pack is fully discharged and recharged three times. Your battery packs are rated for only a certain number of recharges, and cycling uses up three of those recharges.

See [Appendix C](#) for an explanation of the LED codes.

If a battery pack does not hold a full charge after being cycled, it is faulty and must be replaced.

Cycling reconditions battery packs that are not holding a full charge. However, some battery packs, such as those having internal faults or those recharged more than the number of times recommended by the manufacturer, will not benefit from cycling.

1. Insert the battery packs into the slots.
2. Using a paper clip or other fine-tipped tool, press the Cycling button and hold it down until the Cycle LED glows. If the LED does not glow, make sure the battery pack is seated in the bottom of the slot. If the LED still does not light, see the “Troubleshooting” section on [page 21](#).
3. Cycling begins automatically. Allow approximately 20 to 24 hours for cycling, whether you are cycling one battery pack or up to four.

Cycling is complete when the green LED below each slot containing a battery pack lights.

4. When all of the green LEDs light, turn off the cycling function by pressing the Cycling button (with a paper clip) and holding it down until the Cycle LED goes off or by removing all of the battery packs.

# Maintaining the charger 9

## Operating conditions

The 1130/1134 Battery Charger is designed to operate in environments that are normally free of dust, dirt, and moisture. It can be operated at temperatures between -4 degrees F (-20 degrees C) and 122 degrees F (50 degrees C).

## Handling the 1130/1134 Battery Charger

- Do not attempt to open the charger. No user-serviceable parts are inside.
- Charge only nickel-cadmium battery packs that have been designed for use in a PTC-1130/1134. Do not attempt to recharge other types of rechargeable batteries or any type of alkaline batteries.
- Do not insert anything other than the specified battery packs into the charger's battery pack slots.
- If you store a battery pack in below-freezing temperatures for more than 1 hour, do not charge the battery pack until it warms up to room temperature.
- Protect the charger from excessive heat, cold, moisture, and harsh, dirty environments.
- Do not leave the charger where moisture will condense on it.

## Cleaning the 1130/1134 Battery Charger

To clean the charger, slightly moisten a soft, clean, lint-free cloth with a mild, nonabrasive cleaner, such as Windex<sup>®</sup>, and wipe the charger's outside surface.

- Do not use a paper towel to clean the charger.
- Do not soak the cloth and do not spray or pour cleaning liquids directly onto the charger.

If the charger becomes extremely dirty or if liquids, dirt, or other foreign materials get inside the case, contact your Telxon service representative.

## Storing the 1130/1134 Battery Charger

- Do not store the charger in temperatures below –40 degrees F (–40 degrees C) or above 158 degrees F (70 degrees C).
- Do not store the charger in a damp or humid environment (over 95% noncondensing).

Pack the charger in the original packing material or in a padded box and store it in a safe place away from dust, dirt, humidity, and excessive heat or cold.

## Servicing the 1130/1134 Battery Charger

Do not attempt to service the 1130/1134 Battery Charger. Only a trained Telxon technician may service the charger.

# Troubleshooting 10

## The Power LED does not light

- Make sure the power pack is plugged into a wall outlet and the connector on the end of the power pack's cable is snug in the charger's power connector.
- Plug the power pack into another outlet.
- Call your Telxon service representative.

## LEDs remain on after the power-on self test

- Remove any battery packs in the charger. Unplug the power pack; then plug it in again.
- Call your Telxon service representative.

## The red LED below a battery pack slot does not light when a battery pack is in the slot

- Move the battery pack to another slot. If the red LED below that slot lights, call your Telxon service representative. If that LED does not light, the battery pack is faulty; replace it.

## All of the battery pack slot LEDs are flashing

- Make sure the battery packs are inserted properly.
- Move the battery packs to different slots.
- Call your Telxon service representative.

See the "Running the power-on self test" section on [page 12](#) for an explanation of the test.

## **A battery pack takes too long to recharge**

- Make sure the battery pack is inserted correctly.
- Clean the contacts on the battery pack.
- Try another battery pack to make sure the charger is working correctly.
- Call your Telxon service representative.

## **The green LED below a battery pack slot never lights**

- Make sure the battery pack is inserted correctly.
- Call your Telxon service representative.

## **Both battery pack slot LEDs do not light**

- Determine if the battery pack is inserted incorrectly.
- Make sure the battery pack is all the way in the battery pack slot.
- Make sure the contacts on the battery pack are touching the contacts in the bottom of the battery pack slot.
- Make sure the contacts on the battery pack and in the battery pack slot are not bent or damaged.
- Make sure the contacts on the battery pack and in the battery pack slot are clean.
- Call your Telxon service representative.

## **The Cycle LED does not light when the Cycling button is pressed**

- Make sure at least one battery pack is installed in the charger.
- Call your Telxon service representative.

## The battery packs are faulty

See the "Disposing of nickel-cadmium batteries" section on [page 8](#) for information on how to dispose of faulty battery packs.

- Cycle faulty battery packs to rejuvenate them. Discard any battery packs that remain faulty after cycling.

## Other problems

- If you experience any other problems or difficulties with your 1130/1134 Battery Charger, notify your Telxon service representative or contact the Telxon Customer Support Center at 1-800-800-8010.



# Appendix A

## Specifications

### Electrical

Charging time:	2 hours maximum for each battery pack; 8 hours maximum for four battery packs
Power:	Power pack supplies 18 VDC at 800 mA
ESD protection:	15 kV
Regulatory:	Complies with FCC Part 15A

### Environmental

Operating temperature:	–4 to 122 degrees F (–20 to 50 degrees C)
Storage temperature: -	–40 to 158 degrees F (–40 to 70 degrees C)
Humidity:	0 to 95% noncondensing

### Physical

Capacity:	Four PTC-1130/1134 battery packs
Width:	10 in/25.4 cm
Depth:	6.5 in/16.5 cm
Height:	10 in/25.4 cm (including clearance needed to remove battery packs)
Weight:	21.5 oz/.61 kg

# Appendix B

## Accessory part numbers

The following table lists part numbers for ordering 1130/1134 Battery Charger accessories.

Table 1. Accessory part numbers

Item	Part number
<b>Hardware</b>	
Power pack	09798-000
1130/1134 battery pack, 7.2-volt NiCd	19389-001
<b>Manuals</b>	
<i>PTC-1130 User's Guide</i>	18844-000
<i>PTC-1134 User's Guide</i>	19364-000
<i>Guide to Maintaining NiCd Batteries</i>	16488-000

## Battery charger LED codes

Two LEDs (one red and one green) are located below each of the four battery pack slots. The following information, which corresponds to the chart on the charger, will help you interpret the LEDs.

Table 2. Battery pack slot LED codes

Status condition	Red LED	Green LED
No battery	Off	Off
Charging	On	Off
Cycling	On	Off
Fully charged	Off	On
Error	Blinking	Blinking

### Both battery pack slot LEDs are off

When a battery pack slot does not contain a battery pack, both LEDs below the slot are off.

### The red LED is on, but the green LED is off

When a battery pack has been properly inserted and has been detected by the charger, only the red LED below the pack's slot lights.

### Both the red LED and the Cycle LED are on

The battery pack is being cycled.

### **The red LED is off, but the green LED is on**

When a battery pack has been fully recharged and is ready for use, only the green LED below the pack's slot lights.

### **Both battery pack slot LEDs are blinking**

If both of the LEDs below a battery pack slot are blinking, the battery pack in that slot is faulty and must be replaced. Refer to the "Troubleshooting" section on **page 20** for more information.

## Power-on self test codes

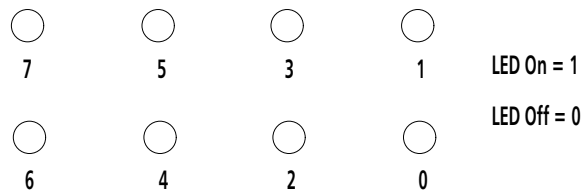
The following table interprets the 1130/1134 Battery Charger's LED codes for the power-on self test. The codes are hexadecimal numbers expressed as binary patterns of the battery pack slot LEDs.

Table 3. Power-on self test LED codes

Test	LED code
RAM test	55
Checksum test	AA
Interrupt test	33
Status LED test	CC
Software version	XX*

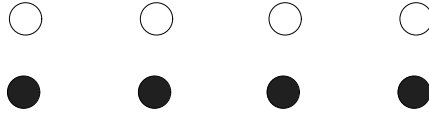
\*Expressed as the binary equivalent of the charger's software version number.

The battery pack slot LEDs are arranged and numbered as follows:

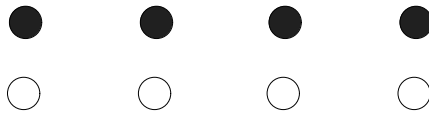


LEDs 0 through 3 express the low bits of the number, and LEDs 4 through 7 express the high bits.

The 55 code for the RAM test is displayed as follows (black LED = glowing):



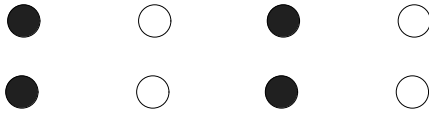
The AA code for the checksum test is displayed as follows:



The 33 code for the interrupt test is displayed as follows:



The CC code for the status LED test is displayed as follows:



# Glossary

cycling	A procedure used to restore nickel-cadmium batteries to full power capacity. Cycling brings the batteries back up to capacity by fully discharging them and then recharging them a number of times.
LED	Light-emitting diode. These are the red and green status lights on the charger's front panel.
mAhr	Milliamperes per hour. This is a measurement of a battery pack's capacity to provide power.
nickel-cadmium battery	A type of rechargeable battery used in PTC-1130/1134 battery packs.
PTC	Portable Tele-Transaction Computer. A programmable, battery-powered, hand-held device used to collect, store, and transmit data.
VDC	Volts direct current. Volts in an electrical current that flow in one direction.

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