SeeDOS Product User Manual

Electrometer
NiCad Battery Replacement

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NOTE: Although this manual is provided by Standard Imaging as a reference, battery replacement by anyone other than a trained Standard Imaging employee will **void the warranty of the electrometer**.

Determine type of battery & manual needed:

Electrometer	*Serial #s starting w/*	*Battery Type*	*Manual Needed*
CDX 2000 or CDX2000A	B94-B97	NiCad	Doc # 80170
CDX2000A	B98-B00	Lead Acid	Doc # 80258
Premier 3000 or MAX-4000	All	Lead Acid	Doc # 80258

When to Replace the sealed NiCad Battery

This section applies to the Standard Imaging CDX-2000 electrometer only. These instructions are not valid for battery replacement in the CDX-2000A series electrometer. Normal lifetime of this battery pack is about 500 charge/ discharge cycles, or approximately two years of typical usage. However, actual lifetime will vary depending on average depth of discharge and battery temperature during charging.

The CDX-2000 battery may need replacement if:

- ✓ After the CDX-2000 has been recharged for 6-8 hours, the display remains blank when the switch is turned to the "RATE," "CHARGE," or "TIME" position.
- ✓ After the CDX-2000 has been recharged for 6-8 hours, the display continues to show "LO BAT."
- ✓ The CDX-2000 is left plugged in to the wall charger for extended periods of tme, such as several weeks. The wall charger is designed to fully charge the battery within 6-8 hours. Charging times exceeding 24 hours put severe thermal stress on the battery and wall charger, and may cause premature failure.

The CDX-2000 battery must be replaced if:

- ✓ After the electrometer has been recharged for 6-8 hours, the voltage of the battery pack, when measured with a voltmeter, is found to be less than 6.8 VDC. This can best be accomplished by opening the housing and carefully measuring voltage from the battery tabs.

Before Replacing the Battery

Check the wall charger before battery replacement When plugged into a proper wall outlet, the no-load output voltage measured with a voltmeter should be 12 - 14 VDC. If it is below this level, the wall charger is probably not functioning properly and should be replaced. Contact Standard Imaging for replacement information.

On the back of the CDX-2000, there is a black fuse holder visible, just to the right of the charger jack. Remove the fuse and verify that it is still viable. Replace if necessary.

Equipment List

Replacement battery pack REF 20005
Soldering iron, electrically grounded
Solder, rosin core, 60/40 Si/Pb nom
Wire cutter, fine
Screwdriver, phillips blade
Screwdriver, slotted blade
Wire stripper
Voltmeter and test leads

Work Environment

All work should be performed on a static-protected work surface and should follow established static and safety precautions. The user and soldering iron should be grounded to the work surface through the use of a wrist or other grounding strap.

Removing the Existing Battery

This manual assumes a basic level of electronics assembly proficiency. Although it is written using non-technical language whenever possible, it is not recommended for a user without electronics handling experience to attempt the procedures listed in this manual. Contact Standard Imaging for warranty or other repair services, if necessary.

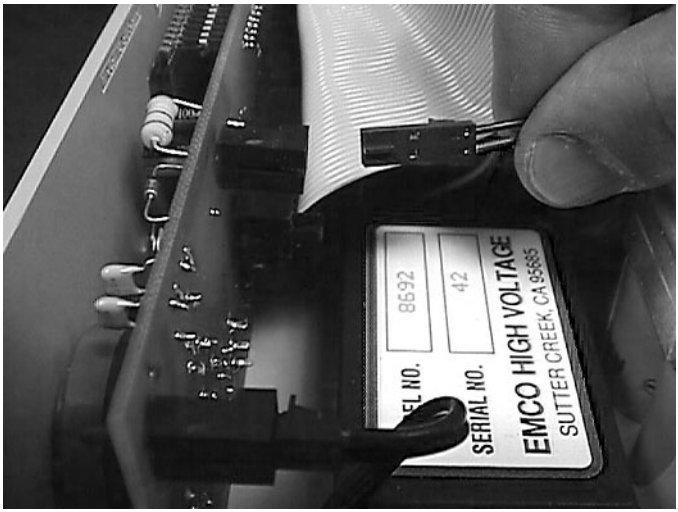
Opening the Case

1. Turn the Mode switch to the OFF position and the Bias switch to the 0% position.
2. Be sure that the CDX-2000 is not plugged in to the wall charger.
3. Working on the static-protected surface, flip the unit over so that the four rubber feet are visible and the charger jack is facing you. Use a phillips screwdriver to completely remove all four feet.
4. The housing will now be in two separate pieces connected by two ribbon cables. DO NOT disconnect the ribbon cables.
5. Keep the Front Panel and display with the part of the housing containing the battery.
6. Arrange the two halves so that the portion with the battery is lying flat and easily accessible. Place the other portion out of the way.

Disconnecting the High Voltage Supply

The High Voltage Supply is a black, rectangular cube with four leads, red and black, orange and green.

1. Disconnect the HV Supply connector with red and black leads by squeezing the small tab visible on the side of the connector and pulling straight back.
2. Disconnect the HV Supply connector with orange and green leads from the Front Panel Printed Circuit Board in the same way. Squeeze the small tab visible on the side of the connector and pull straight back.



Disconnecting the Battery

1. Use a phillips or slotted screwdriver to remove the four self-tapping screws holding the battery bracket to the housing, and set them aside for later reuse.
2. Slightly raising the battery from the housing, use the wire cutter and clip the one red and two black wires attached to the battery tabs, as close to the battery tabs as is practical.

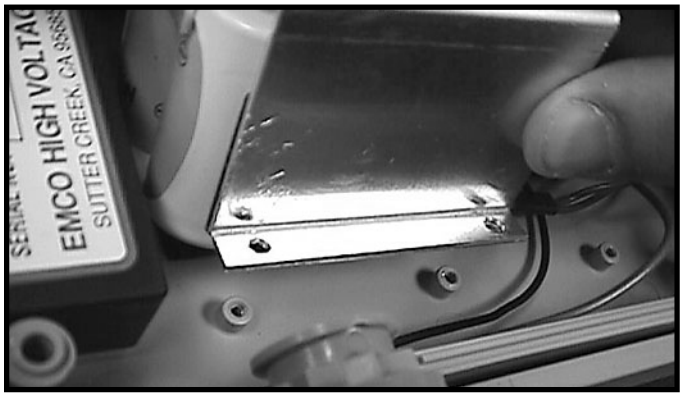
3. Remove the old battery from the housing.
4. Remove the old battery from the battery bracket.
5. Properly dispose of the old battery.

NOTE: This battery contains nickel and cadmium, and should be delivered to a NiCd battery recycling facility or returned to Standard Imaging for proper disposal.

Installing the New Battery

1. Insert the new battery into the metal battery bracket so that it is positioned in the same manner as the old battery.
2. Using the wire stripper, trim back the insulation about 1/8 in. on the one red and two black wires previously separated from the old battery.
3. Using proper technique, solder the wires back to the correct polarity tab on the battery,

   Black = (–), Red = (+)
4. Realign the battery bracket (with battery inside) over the four standoffs molded into the bottom of the housings and secure with the four self-tapping screws.



5. Re-insert the connectors from the High Voltage Supply to the Front Panel Printed Circuit Board. First connect the orange and green wired connector, followed by the red and black wired connector.
6. Return the top half of the case and handle to the unit. Make sure that no wires are pinched as the halves are seated together.

Charging the Battery

Fully recharge the electrometer before using.

1. Connect the electrometer to the wall charger. Allow the unit to charge for 6 to 8 hours.
2. Never leave the wall charger connected to the electrometer for more than 24 hours or the battery pack may be damaged.
3. Disconnect the wall charger. Use a voltmeter to measure the battery pack voltage. This is best accomplished by opening the housing and carefully meausring from the battery tabs. A fully-charged battery pack voltage will measure from 7.8 to 8.4 VDC.
4. Turn on the electrometer and verify proper operation.

⚠ CAUTION: Charging the battery is not to exceed a 24 hour period.

CDX-2000A
Battery Replacement
Instructions

When to Replace the CDX-2000A sealed NiCad Battery

This section applies to the Standard Imaging CDX-2000A electrometer only. These instructions are not valid for battery replacement in the CDX-2000 series electrometer. Normal lifetime of this battery pack is about 500 charge/ discharge cycles, or approximately two years of typical usage. However, actual lifetime will vary depending on average depth of discharge and battery temperature during charging.

The CDX-2000A battery may need replacement if:

- ✓ After the CDX-2000A has been recharged for 6-8 hours, the display remains blank when the switch is turned to the "RATE," "CHARGE," "ZERO," or "VOLTAGE" positions.
- ✓ After the CDX-2000A has been recharged for 6-8 hours, the display continues to show "Recharge Battery."
- ✓ The CDX-2000A is left plugged in to the wall charger for extended periods of time, such as several weeks. The wall charger is designed to fully charge the battery within 6-8 hours. Charging times exceeding 24 hours put severe thermal stress on the battery and wall charger, and may cause premature failure.

The CDX-2000A battery must be replaced if:

- ✓ After the electrometer has been recharged for 6-8 hours, the voltage of the battery pack, when measured with a voltmeter, is found to be less than 6.8 VDC.

Before Replacing the Battery

Check the wall charger before battery replacement When plugged into a proper wall outlet, the no-load output voltage measured with a voltmeter should be 12 - 14 VDC. If it is below this level, the wall charger is probably not functioning properly and should be replaced. Contact Standard Imaging for replacement information.

Equipment List

Replacement battery pack REF 20005
Soldering iron, electrically grounded
Solder, rosin core, 60/40 Si/Pb nom
Wire cutter, fine
Screwdriver, phillips blade
Screwdriver, slotted blade
Wire stripper
Voltmeter and test leads

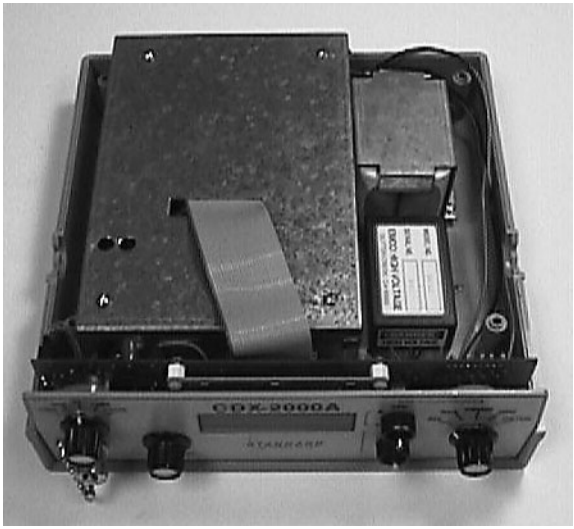
Work Environment

All work should be performed on a static-protected work surface and should follow established static and safety precautions. The user and soldering iron should be grounded to the work surface through the use of a wrist or other grounding strap.
This manual assumes a basic level of electronics assembly proficiency. Although it is written using non-technical language whenever possible it is not recommended for a user without electronics handling experience to attempt the procedures listed in this manual. Contact Standard Imaging for warranty or other repair services, if necessary.

Removing the Existing Battery

Opening the Case

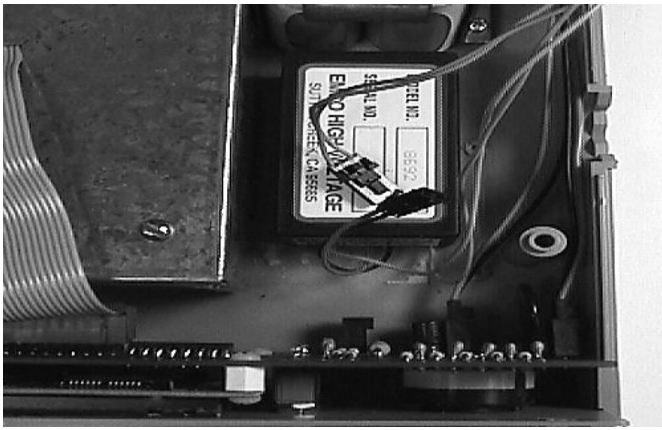
1. Turn the Mode switch to the OFF position and the Bias switch to the 0% position.
2. Be sure that the CDX-2000A is not plugged in to the wall charger.
3. Working on the static-protected surface, flip the unit over so that the four rubber feet are visible and the charger jack is facing you. Use a phillips screwdriver to completely remove all four feet.
4. Place the top half of the case and the handle off to one side. The electrometer should now look like this.



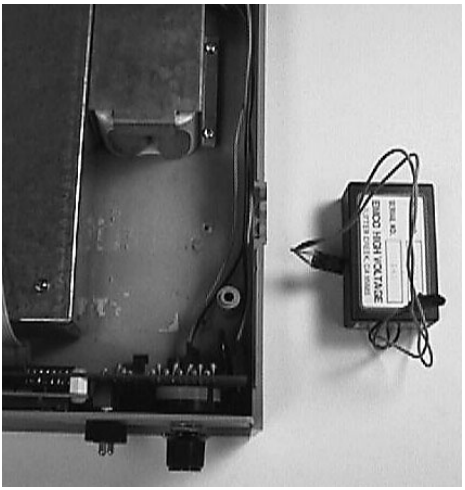
Disconnecting the High Voltage Supply

The High Voltage Supply is a black, rectangular cube with four leads, red and black, orange and green.

1. Disconnect the HV Supply connector with red and black leads by squeezing the small tab visible on the side of the connector and pulling straight back.
2. Disconnect the HV Supply connector with orange and green leacs from the Front Panel Printed Circuit Board in the same way. Squeeze the small tab visible on the side of the connector and pull straight back.

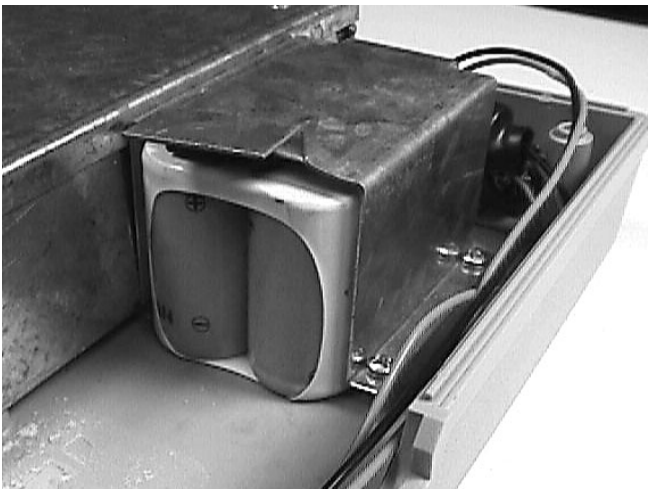


3. Use a flat bladed screwdriver to carefully pry the HV Supply from the bottom of the case. Remove the HV Supply and save for later re-installation.

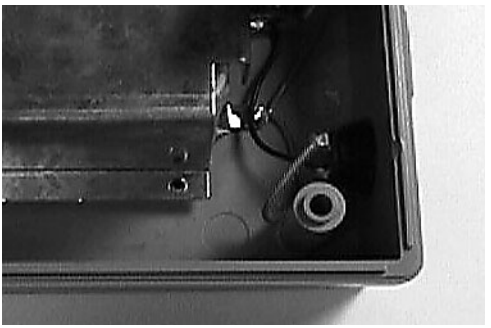


Modifying the Battery Bracket

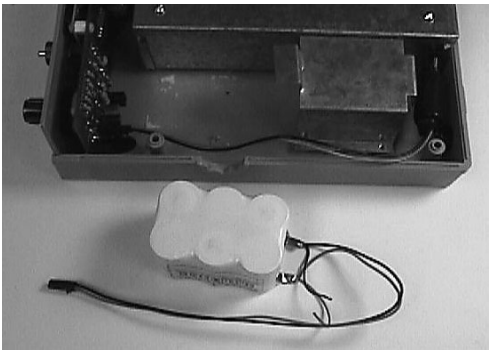
1. Using a pliers, bend the inner tab on the battery bracket upward to allow enough space to slide out the battery.



2. Use the wire cutter to cut the red and black wires at the connection point to the charger jack. Note the locations to which each is soldered as these will be reconnected.



3. Pull the entire battery assembly through the bracket and remove.



4. Remove the wires soldered to the old battery and install them in the same orientation to the new battery.
5. Properly dispose of the old battery.

NOTE: This battery contains nickel and cadmium, and should be delivered to a NiCd battery recycling facility or returned to Standard Imaging for proper disposal.

Installing the New Battery

1. Place the battery assembly, with the wires attached, in the bracket.
2. Solder the red and black wires to the charger jack.
3. Use a pliers to bend the inner tab so that the battery assembly is enclosed.
4. Return the HV Supply to the case.
5. Reconnect the orange and green leads on the HV Supply to the Front Panel Printed Circuit Board.
6. Reconnect the red and black leads on the HV Supply to the Front Panel Printed Circuit Board.
7. Return the top half of the case and handle to the unit.
8. Flip the unit onto its back. Use a phillips screwdriver to attach all four feet.

Charging the Battery

Fully recharge the electrometer before using.

1. Connect the electrometer to the wall charger. Allow the unit to charge for 6 to 8 hours.
2. Never leave the wall charger connected to the electrometer for more than 24 hours or the battery pack may be damaged.
3. Disconnect the wall charger. Use a voltmeter to measure the battery pack voltage. A fully-charged battery pack voltage will measure from 7.8 to 8.4 VDC.

⚠ CAUTION: Charging the battery is not to exceed a 24 hour period.

Warranty

This product is sold by Standard Imaging Inc. under the warranty herein set forth. The warranty is extended only to the buyer purchasing the product directly from Standard Imaging Inc. or as a new product from an authorized dealer or distributor of Standard Imaging Inc.

For a period of twelve (12) months from the date of original delivery to the purchaser or a distributor, this product is warranted against functional defects in materials and workmanship, provided it is properly operated under conditions of normal use, and that repairs and replacements are made in accordance herewith. The foregoing warranty shall not apply if the product has been disassembled, altered or repaired other than by Standard Imaging Inc. or if the product has been subject to abuse, misuse, negligence or accident.

Standard Imaging's sole and exclusive obligation and the purchaser's sole and exclusive remedy under the above warranties are limited to repairing or replacing free of charge, at Standard Imaging's option, a product: (1) which contains a defect covered by the above warranties; (2) which are reported to Standard Imaging not later than seven (7) days after the expiration date of the 12-month warranty period; (3) which are returned to Standard Imaging promptly after discovery of the defect; and (4) which are found to be defective upon Standard Imaging's examination. Transportation charges are the buyer's responsibility. STANDARD IMAGING INC. SHALL NOT BE OTHERWISE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO, INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, OR SPECIAL DAMAGES.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WHETHER STATUTORY OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL STANDARD IMAGING INC. BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE, MISUSE OR ABUSE OF THE PRODUCT OR CAUSED BY ANY DEFECT, FAILURE OR MALFUNCTION OF THE PRODUCT, WHETHER A CLAIM OF SUCH DAMAGE IS BASED UPON THE WARRANTY, CONTRACT, NEGLIGENCE, OR OTHERWISE.