



## **Guidelines for Handling Lithium Batteries**

(Catalog Number 1747-BA)

Lithium batteries are primary (not rechargeable) cells that give extended memory support for Rockwell Automation products.

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### Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at <http://www.ab.com/manuals/gi>) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.





In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual we use notes to make you aware of safety considerations.

<b>WARNING</b> 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
<b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.
<b>ATTENTION</b> 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: <ul style="list-style-type: none"><li>• identify a hazard</li><li>• avoid a hazard</li><li>• recognize the consequence</li></ul>
<b>SHOCK HAZARD</b> 	Labels may be located on or inside the drive to alert people that dangerous voltage may be present.
<b>BURN HAZARD</b> 	Labels may be located on or inside the drive to alert people that surfaces may be dangerous temperatures.

## For More Information

### Related Publications

<b>For:</b>	<b>Refer to this Document:</b>	<b>Pub. No.:</b>
A more detailed description on how to install and use your modular SLC™ 500 system.	<i>SLC 500 Fixed Hardware Style User Manual</i>	1747-6.21
A more detailed description on how to install and use your modular SLC 500 system.	<i>SLC 500 Modular Hardware Style User Manual</i>	1747-UM011

If you need to replace the 1747-BA battery in your MicroLogix™ 1500 controller, refer to the *MicroLogix™ 1500 Programmable Controllers User Manual*, publication 1764-UM001.

### How to Get More Information

If you would like a manual, you can:

- download an electronic version from the internet at:  
**www.theautomationbookstore.com**
- order a printed manual by:
  - contacting your local distributor or Rockwell Automation representative
  - visiting **www.theautomationbookstore.com** and placing your order
  - calling 1.800.963.9548 (USA/Canada) or 001.330.725.1574 (Outside USA/Canada)

## Safety Considerations

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### ATTENTION

Failure to follow the guidelines in this document may result in damaged equipment and/or personal injury.



Use the battery for its intended application only.

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### IMPORTANT

Do not:

- charge the battery
  - open, puncture or crush the battery
  - incinerate or expose the battery to high temperatures
  - solder leads
  - short positive or negative terminals together
  - ship or dispose of battery except according to the procedures in this document
- 

For lithium batteries installed in Class I, Division 2 Hazardous Locations:

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### WARNING

**Explosion Hazard** - Batteries must only be changed in an area known to be non-hazardous.



### AVERTISSEMENT

**RISQUE D'EXPLOSION** - Afin d'éviter tout risque d'explosion, s'assurer que l'emplacement est désigné non dangereux avant de changer la batterie.



## Storing Lithium Batteries

- Store in a cool, dry environment typically 20° to 25° C (68° to 77° F) with 40-60% relative humidity. Regularly monitor the temperature and humidity of the storage area.
- Use a first-in/first-out system for handling stored batteries.
- Store the battery (with a copy of this publication) in the original containers away from flammable materials.
- Keep track of storage time. Reference storage time to the date of manufacture.
- *Do not* store batteries longer than 10 years.
- *Do not* store used batteries longer than 3 months before disposal.
- Clearly mark the contents of the storage area.
- Place a Lith-X or Class D Powder fire extinguisher in a readily accessible area in or around the storage area.
- Ventilate and protect the storage area against fire. You must have a system that automatically detects and extinguishes fires and automatically activates an alarm signal.
- *Do not* smoke in the storage area.

## Transporting Lithium Batteries

One or Two Batteries — Each battery contains 0.23 grams of lithium. Therefore, up to two batteries can be shipped together within the United States without restriction. Regulations governing shipment to or within other countries may differ.

Three or More Batteries — Procedures for the transportation of three or more batteries shipped together within the United States are specified by the Department of Transportation (DOT) in the Code of Federal Regulations, CFR49, “Transportation.” An exemption to these regulations, DOT - E7052, covers the transport of certain hazardous materials classified as flammable solids. This exemption authorizes transport of lithium batteries by motor vehicle, rail freight, cargo vessel, and cargo-only aircraft, providing certain conditions are met. Transport by passenger aircraft is not permitted.

A special provision of DOT-E7052 (11th Rev., October 21, 1982, par. 8-a) provides that:

“Persons that receive cell and batteries covered by this exemption may reshipe them pursuant to the provisions of 49 CFR 173.22a in any of these packages authorized in this exemption including those in which they were received.”

The Code of Federal Regulations, 49 CFR 173.22a, relates to the use of packaging authorized under exemptions. In part, it requires that you must maintain a copy of the exemption at each facility where the packaging is being used in connection with shipment under the exemption.

Shipment of depleted batteries for disposal may be subject to specific regulation of the countries involved or to regulations endorsed by those countries, such as the IATA Restricted Articles Regulations of the International Air Transport Association, Geneva, Switzerland.

Do not ship lithium batteries on passenger aircraft.

## Exporting to Foreign Countries

Shipment of materials outside the United States is subject to specific regulations of the countries involved or to regulations endorsed by those countries, such as the Restricted Articles Regulations of the International Air Transportation Association (IATA), Geneva, Switzerland.

See the disposal section for other regulations which apply to the shipment of depleted batteries.

Regulations for transporting lithium batteries are periodically revised.

## Lithium Battery Disposal

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### ATTENTION



*Do not* incinerate or dispose of lithium batteries in general trash collection. They may explode or rupture violently. Check state and local regulations dealing with the disposal of these materials. You are legally responsible for hazards created while your battery is being disposed.

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For disposal, batteries must be packaged and shipped in accordance with transportation regulations, to a proper disposal site. The U.S. Department of Transportation authorizes shipment of “Lithium batteries for disposal” by motor vehicle only in regulation 173.1015 of CFR 49 (effective January 5, 1983). For additional information contact:

U.S. Department of Transportation  
Research and Special Programs Administration  
400 Seventh Street, S.W.  
Washington, D.C. 20590

Although the Environmental Protection Agency at this time has no regulations specific to lithium batteries, the material contained may be considered toxic, reactive, or corrosive. The person disposing of the material is responsible for any hazard created in doing so. State and local regulations may exist regarding the disposal of these materials.

For a lithium battery product safety data sheet, contact the manufacturer:

Sanyo Energy Corporation  
600 Supreme Drive  
Bensenville, IL 60106  
USA

or

Tadarand US Battery Division  
2 Seaview Blvd.  
Port Washington, NY 11050  
USA

Collect batteries for disposal carefully to prevent short circuiting, compacting, or destroying the battery case.

## Disposing of Depleted Batteries

1. Visually inspect all batteries for damage to the battery casing or leakage of electrolyte. If a battery is damaged and/or leaking, see the following section on handling damaged batteries.
2. If the battery has leads and is clean and undamaged, use side cutters to remove the leads as close to the body of the battery as possible.

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**ATTENTION**

*Do not* damage the battery case when removing leads.



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3. Put clean and undamaged batteries in a polyethylene bag and heat seal the bag.
  4. Store the bagged batteries in a closed metal container filled with vermiculite. Alternate layers of batteries and vermiculite.
  5. Contact your local Environmental Protection Agency (EPA) office for information about battery disposal companies and proper labeling of battery containers.

Lithium batteries can be stored and shipped as universal waste in most states in the United States of America. Alternately, you can ship lithium batteries as hazardous waste.

## Disposal of Damaged and/or Leaking Batteries

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### ATTENTION



If the batteries are badly damaged and/or leaking, evacuate all personnel from the immediate area.

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You must wear protective clothing (protective eyewear, clothes, safety shield, and self-contained breathing apparatus).

#### Do not:

- pick up ruptured batteries with bare hands. Lithium can cause skin burns. Use tongs, scoops, or a shovel to place the batteries in a mineral-oil-filled container.
- breathe fumes. Ventilate the area to disperse the fumes before entering the room.

If toxic or corrosive material comes in contact with your eyes or skin, flush with water and consult a physician. Dispose of clothing that is contaminated.

Use the following procedure to dispose of damaged and/or leaking batteries:

1. Put the damaged batteries in two polyethylene bags and add about 1 ounce of calcium carbonate ( $\text{CaCO}_3$ ) to the inner bag. Slowly-leaking batteries have a deposit of white salt crystals on the outside of the battery casing.
2. Heat seal both bags.
3. Take the container outside and ventilate the area where you discovered the damaged batteries.
4. Contact your local EPA office for information about battery disposal companies.

## Overheated Batteries

An overheated battery may explode or rupture violently. If you must try to save the battery, wear the protective clothing described above. If a lithium battery overheats:

- take shelter
- attempt to remove any external source of heat
- remove power from any equipment involved
- remove the battery to a well-ventilated fire-protected area after it cools



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## In Case of a Lithium Fire

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**ATTENTION**

*Do not* use water or carbon dioxide (CO<sub>2</sub>) fire extinguishers in a lithium battery fire. Lithium reacts with these substances.

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If lithium is burning:

- avoid exposure to toxic fumes from burning lithium
- smother the fire using a Class D fire extinguisher or a graphite powder, such as Lith-X
- you can also use a long-handled tool to apply an appropriate metal fire extinguishing powder

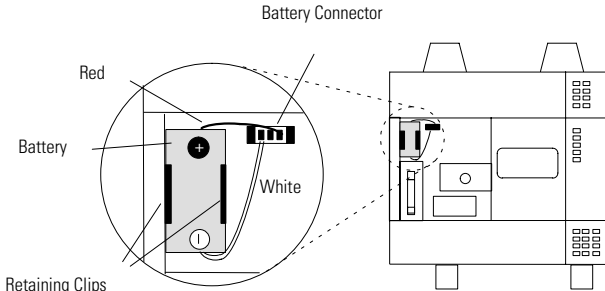
## Hazards to Personnel

Potential hazards to personnel include:

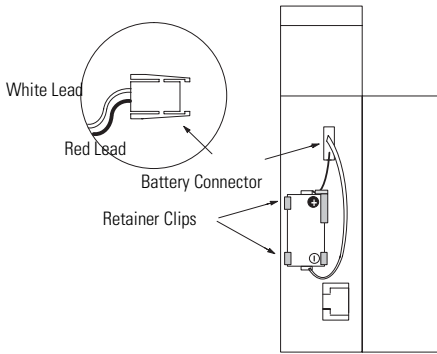
- burns from overheated cells
  - Wash skin with running water and go to the nearest medical center.
- injury from explosion or violent rupture of overheated cells
- injury from fire caused by combustion of lithium
- exposure to toxic or corrosive liquids or gases from the battery or its decomposition products
  - Remove and discard contaminated clothing.
  - Wash areas where clothing touched skin.
  - If breathing difficulties result, remove the person from the area, administer oxygen, then go to the nearest medical center.
  - If the battery contents come in contact with eyes, rinse eyes immediately for at least 15 minutes without interruption. Go to the nearest medical center and advise the attending physician of contact with lithium batteries.

## Lithium Battery Location

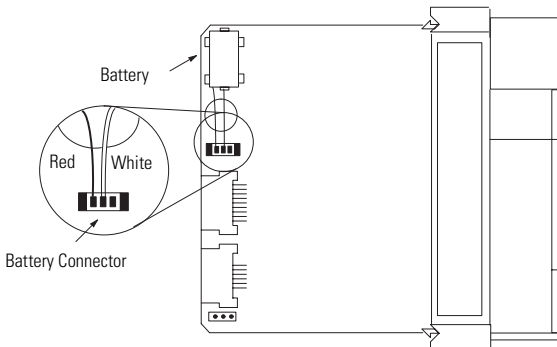
### SLC 500 Fixed Controller



### SLC 5/01 and 5/02 processors



### SLC 5/03, 5/04, and 5/05 processors



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## Installing the SLC 5/01, -5/02 and Fixed Controller Battery

For battery installation or replacement do the following:

1. Open the door of the processor. Do not remove processor power.

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**IMPORTANT**

Battery back-up is optional with the SLC 500 fixed controllers and the 1747-L511 processors. These processors are shipped from the factory with capacitor back-up that provides memory back-up of 5-30 days.

If you are installing a battery in a new processor (battery never installed before), remove the jumper from the battery connector socket. Store the jumper in safe place for possible future use without the battery.

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2. Locate the battery. Refer to page 10 for battery location.

If you are replacing an old battery, unplug the existing battery connector and remove from the retainer clips.

3. Insert a new or replacement battery in the holder making sure it is held in by the retainer clips.
4. Plug the battery connector into the socket.
5. Close the processor door.

## Installing the SLC 5/03, -5/04, and -5/05 Battery

To install or replace the lithium battery:

1. Remove power from the SLC 500 power supply.
2. Remove the processor from the chassis by pressing the retainer clips at both the top and bottom of the module and slide it out.

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**ATTENTION**

Do not expose the processor to surfaces or other areas that may hold an electrostatic charge. Electrostatic charges can alter or destroy memory.

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3. Unplug the battery connector. The figure on page 10 shows the battery connector location.

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**IMPORTANT**

The SLC 5/03, SLC 5/04, and SLC 5/05 processors have a capacitor that provides at least 30 minutes of battery back-up while the battery is disconnected. Data in RAM is not lost if the battery is replaced within 30 minutes.

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4. Remove the old battery.
5. Insert a new battery into the battery retaining clips.
6. Plug the battery connector into the socket.
7. Insert the module back into the SLC 500 chassis.
8. Restore power to the SLC 500 power supply.

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