

## Installing an External Cache Battery (ECB)

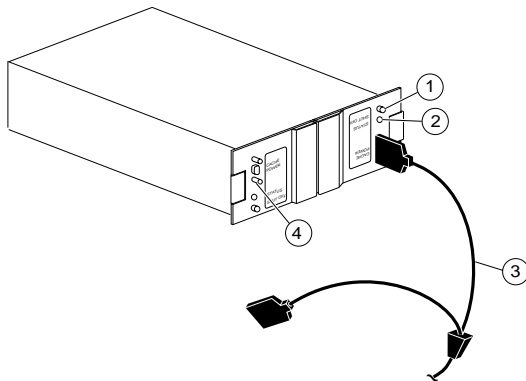
The HSZ70, the HSG80, and the HSZ80 all use the same ECB. This document contains instructions to replace an ECB in an HSZ70 HSOF Version 7.x Array Controller, the HSG80 ACS Version 8.x Array Controller, and the HSZ80 ACS Version 8.x Array Controller. See the appropriate *HSZ70 Array Controller HSOF Version 7.x Service Manual*, *HSG80 Array Controller ACS Version 8.x User's Guide*, *HSZ80 Array Controller ACS Version 8.x User's Guide*, *HSG80 Array Controller ACS Version 8.3 Maintenance and Service Guide*, or *HSZ80 ACS Version 8.3 Maintenance and Service Guide* for instructions on upgrading a single-controller configuration to a dual-redundant controller configuration.

### Replacing an External Cache Battery Storage Building Block

Use this procedure for the following configurations:

**HSZ70 HSOF Version 7.x Dual-Redundant Controller**  
**HSG80 ACS Version 8.0 Dual-Redundant Controller**  
**HSZ80 ACS Version 8.1 Dual-Redundant Controller**

Use the following steps to replace an external cache battery (ECB) storage building block (SBB) (see Figure 1):



- 1 Shut off button
- 2 Status LED
- 3 ECB Y cable
- 4 Faceplate and controls for second battery

Figure 1. ECB for Dual-Redundant Controller Configurations

**CAUTION:** Do not disconnect the old ECB until the batteries in the new ECB are fully charged.

**NOTE:** This procedure assumes that a single ECB SBB with a dual battery is installed and an empty slot is available for the replacement ECB SBB. If an empty slot is not available, place the new ECB SBB on the top of the enclosure. After the old ECB SBB has been removed, carefully insert the new ECB SBB into the empty slot.

1. Connect a PC or terminal to the controller with the operational ECB. The controller to which you're connected is "this controller"; the controller whose ECB you're replacing is the "other controller."
2. Disable failover with the following command:  
**SET NOFAILOVER**
3. [HSZ70 and HSZ80] Start FRUTIL with the following command:  
**RUN FRUTIL**
4. [HSZ70] Enter option 3, *Replace other cache module battery*, from the FRUTIL Main menu:  
FRUTIL Main Menu:
  1. Replace or remove a controller or cache module
  2. Install a controller or cache module
  3. Replace other cache module battery
  4. Replace a PVA module
  5. Replace an I/O module
  6. ExitEnter choice: 1, 2, 3, 4, 5, or 6 -> 3
5. [HSZ80] Enter option 3, *Replace other cache module battery*, from the FRUTIL Main menu:  
FRUTIL Main Menu:
  1. Replace or remove a controller or cache module
  2. Install a controller or cache module
  3. Replace other cache module battery
  4. Replace a PVA module
  5. Replace an I/O module
  6. Set battery life to new
  7. ExitEnter choice: 1, 2, 3, 4, 5, 6, or 7 -> 3

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6. [HSZ70 and HSZ80] Confirm that you have a new dual-battery replacement ECB SBB. FRUTIL displays the following:  
Do you have a NEW replacement battery? Y/N
  7. [HSZ70 and HSZ80] Enter Y(es) and press return.  
**NOTE:** If an empty slot is not available, place the new ECB SBB on the top of the enclosure.
  8. [HSZ70 and HSZ80] Confirm that you want to install a replacement ECB SBB. FRUTIL displays the following:  
Replace the battery for the cache module in slot A [or B]? Y/N
  9. [HSZ70 and HSZ80] Enter Y(es) and press return.
  10. [HSG80] Shut down the controllers. First shut down the “other controller,” then shut down “this controller” with the following commands:  
**SHUTDOWN OTHER\_CONTROLLER**  
**SHUTDOWN THIS\_CONTROLLER**  
When the controllers shut down, their reset buttons and first three LEDs are lit continuously.
  11. [HSG80] Turn off the power to the subsystem.
  12. Insert the new ECB SBB into an empty slot.

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**CAUTION:** The ECB cable has a 12-volt and a 5-volt pin. Improper handling or misalignment when connecting or disconnecting could cause these pins to contact ground, resulting in cache module damage.

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13. [HSG80] Restore power to the subsystem. The controllers automatically restart.
14. Connect the open end of the ECB Y cable to the new ECB.

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**CAUTION:** Do not disconnect the old ECB until the batteries in the new ECB are fully charged. The new ECB's status light will be lit continuously to indicate that its batteries are fully charged. A blinking status light indicates that its batteries are charging. You may operate the subsystem regardless of the old ECB's status.

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15. Wait until the new ECB's status light is on continuously, then disconnect the ECB cable from the old ECB.  
  
[HSZ80] FRUTIL displays the following:  
Setting battery A [or B] state to new.  
Testing battery attached to cache module A [or B].  
Test complete. Battery is good.
16. [HSZ80] Wait for FRUTIL to terminate.

17. Enable failover, and re-establish the dual-redundant configuration with the following command:  
**SET FAILOVER COPY=THIS\_CONTROLLER**  
This command copies the subsystem's configuration from “this controller” to the “other controller.”
18. Disconnect the PC or terminal from the controller.
19. To connect the other cache module to the new ECB SBB, repeat the appropriate steps for the remaining controller and its cache module.
20. Remove the old ECB SBB.  
  
**NOTE:** If an empty slot was not available, and the new ECB SBB was placed on the top of the enclosure, carefully insert it now into the empty slot.

## Replacing an External Cache Battery Storage Building Block

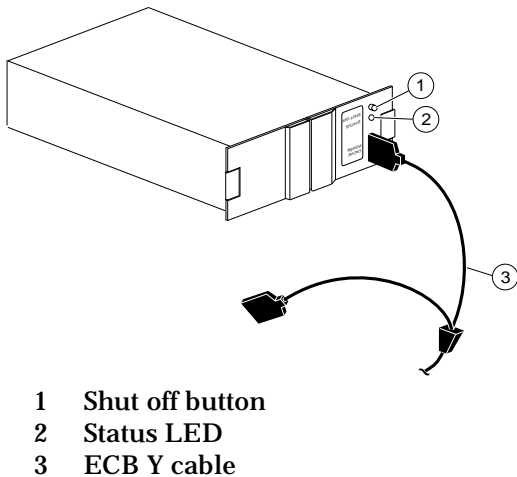
Use this procedure for the following configurations:

HSZ70 HSOF Version 7.x Single Controller

HSG80 ACS Version 8.0 Single Controller

HSZ80 ACS Version 8.1 Single Controller

Use the following steps to remove and replace an ECB SBB (see Figure 2):



- 1 Shut off button
- 2 Status LED
- 3 ECB Y cable

Figure 2. ECB for Single-Controller Configurations

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**CAUTION:** Do not disconnect the old ECB until the batteries in the new ECB are fully charged.

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1. If the controller and cache module are not operating, go to step 4. Otherwise, go to the next step.
2. Connect a PC or terminal to the controller's maintenance port.
3. Shut down the controller the following command:  
**SHUTDOWN THIS\_CONTROLLER**  
When the controller shuts down, its reset button and first three LEDs are lit continuously.
4. Turn off the power to the subsystem.
5. Insert the new ECB SBB into its slot.

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**CAUTION:** The ECB cable has a 12-volt and a 5-volt pin. Improper handling or misalignment when connecting or disconnecting could cause these pins to contact ground, resulting in cache module damage.

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6. Connect the open end of the ECB Y cable to the new ECB.
7. Restore power to the subsystem. The controller automatically restarts.

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**CAUTION:** Do not disconnect the old ECB until the batteries in the new ECB are fully charged. The new ECB's status light will be lit continuously to indicate that its batteries are fully charged. A blinking status light indicates that its batteries are charging. You may operate the subsystem regardless of the old ECB's battery status, but do not disconnect the old ECB until the batteries in the new ECB are fully charged.

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8. Wait until the new ECB's status light is on continuously, then disconnect the ECB cable from the old ECB.
9. [HSZ80] Start FRUTIL with the following command:  
**RUN FRUTIL**
10. [HSZ80] An internal clock monitors the life of the battery. When replacing a battery this clock must be reset. Choose option 6, *Set battery life to new*, from the FRUTIL Main menu to reset the internal clock.  
FRUTIL Main Menu:
  1. Replace or remove a controller or cache module
  2. Install a controller or cache module
  3. Replace other cache module battery
  4. Replace a PVA module
  5. Replace an I/O module
  6. Set battery life to new
  7. ExitEnter choice: 1, 2, 3, 4, 5, 6, or 7 -> 6
11. [HSZ80] Choose option 1, *Battery attached to cache module A*, from the Battery Replacement menu:  
Which battery was replaced while powered off?
  1. Battery attached to cache module A
  2. Battery attached to cache module B
  3. Both batteries
  4. ExitEnter choice: 1, 2, 3, or 4 -> 1  
FRUTIL displays the following:  
Setting battery A state to new.  
Testing battery attached to cache module A.  
Test complete. Battery is good.
12. [HSZ80] Wait for FRUTIL to terminate.
13. Remove the old ECB SBB.

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## Replacing an External Cache Battery Storage Building Block

Use this procedure for the following configurations:

HSG80 ACS Version 8.2 Single Controller  
HSG80 ACS Version 8.2 Dual-Redundant Controller  
HSG80 ACS Version 8.3 Single Controller  
HSG80 ACS Version 8.3 Dual-Redundant Controller  
HSZ80 ACS Version 8.2 Single Controller  
HSZ80 ACS Version 8.2 Dual-Redundant Controller  
HSZ80 ACS Version 8.3 Single Controller  
HSZ80 ACS Version 8.3 Dual-Redundant Controller

The ECB SBB can be replaced with cabinet power on or off. A single-battery ECB SBB is shown in Figure 2 and a dual-battery ECB SBB is shown in Figure 1.

### Replacing an External Cache Battery Storage Building Block with Cabinet Power On

Use the following steps to replace the ECB SBB with the cabinet powered on:

**NOTE:** The procedure for a dual-redundant controller configuration assumes that a single ECB SBB with a dual battery is installed and an empty slot is available for the replacement ECB SBB. If an empty slot is not available, place the new ECB SBB on the top of the enclosure. After the old ECB SBB has been removed, carefully insert the new ECB SBB into the empty slot.

1. Connect a PC or terminal to the controller with the ECB SBB that you intend to replaced. The controller to which you're connected is "this controller."
2. Start FRUTIL with the following command:  
**RUN FRUTIL**  
FRUTIL displays the following:  
Do you intend to replace this controller's cache battery? Y/N
3. Enter Y(es). FRUTIL displays the following:  
If the batteries were replaced while the cabinet was powered down, press return.  
Otherwise follow this procedure:  
WARNING:Ensure that at least one battery is connected to the Y cable at all times during this procedure.  
1.Connect the new battery to the unused end of the 'Y' cable attached to cache A [or B].  
2.Disconnect the old battery. Do not wait for the new battery's status light to turn solid green.  
3.Press return.

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**CAUTION:** The ECB cable has a 12-volt and a 5-volt pin. Improper handling or misalignment when connecting or disconnecting could cause these pins to contact ground, resulting in cache module damage.

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4. Insert the new ECB SBB into the empty battery slot.  
**NOTE:** If an empty slot is not available, place the new ECB SBB on the top of the enclosure.
5. Connect the new battery to the unused end of the Y cable attached to the cache module.
6. Disconnect the old battery. Do not wait for the new battery's status light to turn solid green.
7. Press return.  
FRUTIL displays the following:  
Updating this battery's expiration date and deep discharge history.  
Field Replacement Utility terminated.
8. Disconnect the PC or terminal from the controller's maintenance port.
9. If this is a dual-redundant controller configuration and you installed a dual-battery ECB SBB and you want to connect the other cache module to the new ECB SBB, connect the PC or terminal to the other controller's maintenance port. The controller to which you're now connected is "this controller."
10. Repeat steps 2 through 8.
11. Remove the old ECB SBB.  
**NOTE:** If an empty slot was not available, and the new ECB SBB was placed on the top of the enclosure, carefully insert it now into the empty slot.

### Replacing an External Cache Battery Storage Building Block with Cabinet Power Off

Use the following steps to replace the ECB SBB with the cabinet powered off:

1. If the controller and cache module are not operating, go to step 4. Otherwise, go to the next step.
2. Connect a PC or terminal to the controller's maintenance port. The controller to which you're connected is "this controller."
3. Shut down the controllers. In single controller configurations, shut down "this controller." In dual-redundant controller configurations, shut down the "other controller" first, then shut down "this controller" with the following commands:  
**SHUTDOWN OTHER\_CONTROLLER**  
**SHUTDOWN THIS\_CONTROLLER**  
When the controllers shut down, their reset buttons and their first three LEDs are lit continuously. This may take several minutes, depending on the amount of data that needs to be flushed from the cache modules.
4. Turn off the power to the subsystem.
5. Insert the new ECB SBB into its slot.

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**CAUTION:** The ECB cable has a 12-volt and a 5-volt pin. Improper handling or misalignment when connecting or disconnecting could cause these pins to contact ground, resulting in cache module damage.

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6. Connect the open end of the ECB Y cable to the new ECB.
7. Restore power to the subsystem. The controller automatically restarts.
8. Disconnect the ECB cable from the old ECB.
9. Start FRUTIL with the following command:  
**RUN FRUTIL**  
FRUTIL displays the following:  
Do you intend to replace this controller's cache battery? Y/N
10. Enter Y(es). FRUTIL displays the following:  
If the batteries were replaced while the cabinet was powered down, press return.  
Otherwise follow this procedure:  
WARNING: Ensure that at least one battery is connected to the Y cable at all times during this procedure.  
1. Connect the new battery to the unused end of the 'Y' cable attached to cache A [or B].  
2. Disconnect the old battery. Do not wait for the new battery's status light to turn solid green.  
3. Press return.
11. Press return.  
FRUTIL displays the following:  
Updating this battery's expiration date and deep discharge history.  
Field Replacement Utility terminated.
12. Disconnect the PC or terminal from the controller's maintenance port.
13. In a dual-redundant controller configuration and if the ECB was replaced for both cache modules, connect the PC or terminal to the other controller's maintenance port. The controller to which you're now connected is "this controller."
14. Repeat steps 9 through 12.
15. Remove the old ECB SBB.