

Replacing an External Cache Battery (ECB)

Open Card Completely Before Beginning Installation Procedures

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Replacing an External Cache Battery (ECB)

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About This Card

This document contains instructions for replacing the ECB in a StorageWorks™ HSG60, HSG80, HSJ80, HSZ70, or HSZ80 subsystem.

For instructions on upgrading a single-controller configuration to a dual-redundant controller configuration, refer to the appropriate array controller user guide or maintenance and service guide.

ECB replacement procedures provided in this card include:

- [HSZ70 Single-Controller Configurations](#), page 3
- [HSZ70 Dual-Redundant Controller Configurations](#), page 3
- [HSG60 and HSG80 Controller Configurations](#), page 4
- [HSJ80 Controller Configurations](#), page 5
- [HSZ80 Controller Configurations](#), page 6
- [Hot-Pluggable Procedure for StorageWorks Model 2100 and 2200 Enclosures](#), page 6

General Information

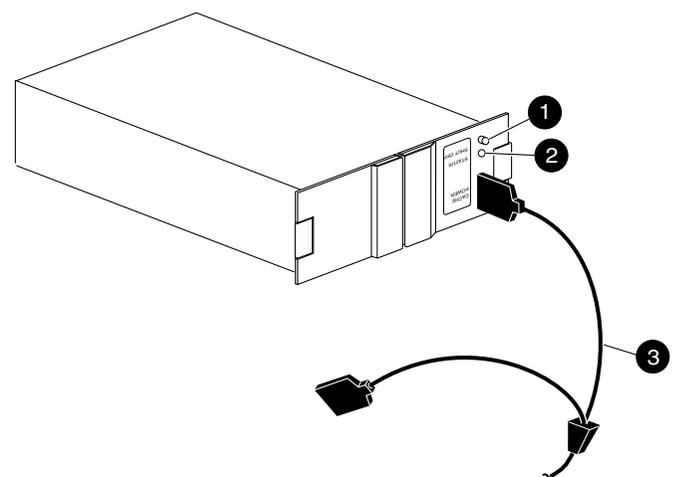
The type of ECB used depends on the StorageWorks controller enclosure type.



WARNING: The ECB is a sealed, rechargeable, lead acid battery that must be recycled or disposed of properly according to local regulations or policies after replacement. Do not incinerate the battery. Improper handling may cause personal injury. The ECB displays the following label:



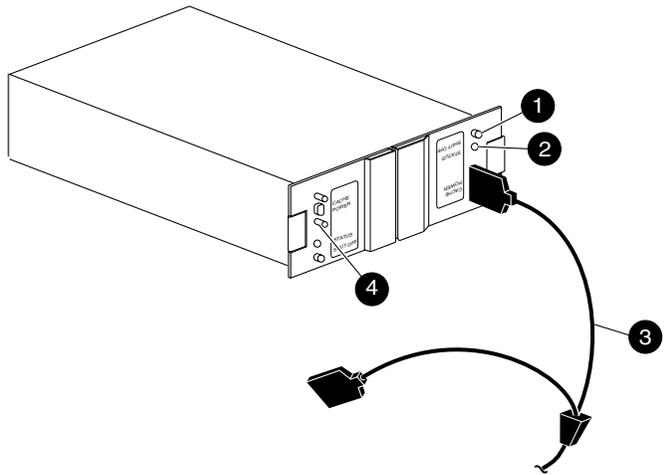
Figure 1 and Figure 2 provide general information about the ECBs used with many StorageWorks controller enclosures.



CX05715B

- ❶ Battery disable switch (SHUT OFF)
- ❷ Status LED
- ❸ ECB Y-cable

Figure 1: Single ECB for single-controller configurations



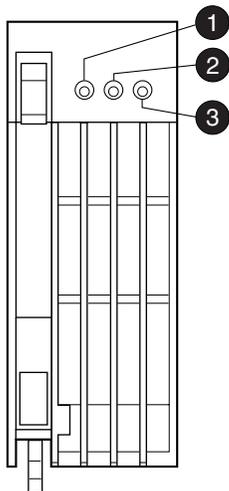
CXO5713B

- ❶ Battery disable switch (SHUT OFF)
- ❷ Status LED
- ❸ ECB Y-cable
- ❹ Faceplate and controls for second battery (dual ECB configuration only)

Figure 2: Dual ECB for dual-redundant controller configurations

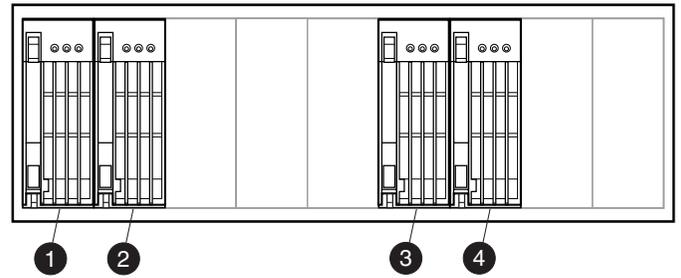
StorageWorks Model 2100 and 2200 controller enclosures use a different type of ECB that does not require an ECB Y-cable (see Figure 3). These enclosures contain four ECB bays. Two bays support Cache A (bays A1 and A2) and two bays support Cache B (bays B1 and B2)—see this relationship in Figure 4.

NOTE: No more than two ECBs are supported within a StorageWorks Model 2100 or 2200 controller enclosure at any time—one for each array controller and cache set. Blanks must be installed in the remaining vacant ECB bays for controlling air flow.

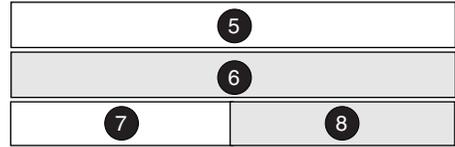


CXO6358A

Figure 3: Status LEDs for a StorageWorks Model 2100 and 2200 enclosure ECB



CXO6864A

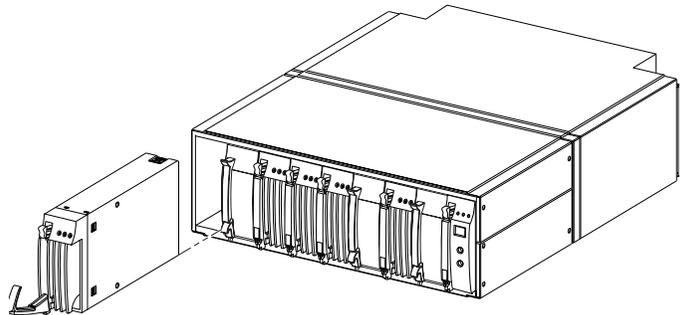


CXO5608B

- ❶ B1 supports cache B
- ❷ B2 supports cache B
- ❸ A2 supports cache A
- ❹ A1 supports cache A
- ❺ Controller A
- ❻ Controller B
- ❼ Cache A
- ❽ Cache B

Figure 4: ECB and cache module locations in a StorageWorks Model 2100 and 2200 enclosure

IMPORTANT: When replacing an ECB (see Figure 5), match the vacant ECB bay with the supported cache module. This bay will always be next to the failed ECB (see Figure 4).



CXO6922B

Figure 5: Removing an ECB that supports cache module B in a StorageWorks Model 2100 and 2200 enclosure

HSZ70 Single-Controller Configurations

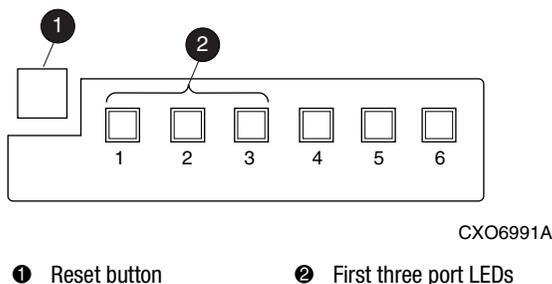
Use the following steps and [Figure 1](#) or [Figure 2](#) to replace an ECB:

1. Is the controller operating?
 - Yes. Connect a PC or terminal to the controller maintenance port supporting the old ECB cache module.
 - No. Go to [step 3](#).
2. Shut down “this controller” with the following command:

```
SHUTDOWN THIS_CONTROLLER
```

NOTE: After the controller shuts down, the reset button ❶ and the first three port LEDs ❷ turn ON (see [Figure 6](#)). This may take several minutes, depending on the amount of data that needs to be flushed from the cache module.

Proceed only after the reset button stops FLASHING and remains ON.



❶ Reset button

❷ First three port LEDs

Figure 6: Controller reset button and first three port LEDs

3. Turn OFF subsystem power.

NOTE: If an empty bay is not available, place the replacement ECB on top of the enclosure.

4. Insert the replacement ECB into an appropriate bay or near the ECB being removed.



CAUTION: The ECB Y-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.

5. Connect the open end of the ECB Y-cable to the replacement ECB.
6. Turn ON subsystem power.

The controller automatically restarts.



CAUTION: Do not disconnect the old ECB Y-cable until the replacement ECB is fully charged. If the replacement ECB status LED is:

- ON, the ECB is fully charged.
- FLASHING, the ECB is charging.

The subsystem can operate regardless of the old ECB status, but *do not* disconnect the old ECB until the replacement ECB is fully charged.

7. Once the replacement ECB status LED turns ON, disconnect the ECB Y-cable from the old ECB.

8. Remove the old ECB and place the ECB in an antistatic bag or on a grounded antistatic mat.

HSZ70 Dual-Redundant Controller Configurations

Use the following steps and [Figure 1](#) or [Figure 2](#) to replace an ECB:

1. Connect a PC or terminal to the maintenance port of the controller that has the operational ECB.

The controller connected to the PC or terminal becomes “this controller”; the controller for the ECB being removed becomes the “other controller.”

2. Enter the following commands:

```
CLEAR CLI  
SHOW THIS_CONTROLLER
```

Is this controller “configured for MULTIBUS_FAILOVER with...” mode?

- Yes. Go to [step 4](#).
- No. The controller is “configured for DUAL_REDUNDANCY with...” in transparent failover mode. Proceed to [step 3](#).

NOTE: [Step 3](#) is a procedural workaround for controllers in transparent failover mode to make sure that the battery test in field replacement utility (FRUTIL) executes properly.

3. Enter the following command:

```
RESTART OTHER_CONTROLLER
```

IMPORTANT: Wait until the following message is displayed before proceeding:

```
“[DATE] [TIME]-- Other controller restarted”
```

4. Disable failover and take the controllers out of dual-redundant configuration with one of the following commands:

```
SET NOFAILOVER  
or  
SET NOMULTIBUS_FAILOVER
```

5. Start the FRUTIL with the following command:

```
RUN FRUTIL
```

6. Enter **3** for the replace the “other controller” cache module battery option.
7. Enter **Y(es)** to confirm the intent to replace the ECB.



CAUTION: Do not disconnect the old ECB Y-cable until the replacement ECB is fully charged. If the replacement ECB status LED is:

- ON, the ECB is fully charged.
- FLASHING, the ECB is charging.

The subsystem can operate regardless of the old ECB status, but do not disconnect the old ECB until the replacement ECB is fully charged.

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

NOTE: If an empty bay is not available, place the replacement ECB on top of the rack (cabinet) or enclosure until the defective ECB is removed.

8. Insert the replacement ECB into an appropriate bay or near the ECB being removed.
9. Connect the open end of the ECB Y-cable to the replacement ECB and tighten the retaining screws.
10. Press **Enter/Return**.
11. Restart the “other controller” with the following commands:

```
CLEAR CLI
RESTART OTHER_CONTROLLER
```

IMPORTANT: Wait until the following message is displayed before proceeding:

```
"[DATE] [TIME] Controllers misconfigured. Type
SHOW_THIS_CONTROLLER"
```



CAUTION: In [step 12](#), entering the appropriate SET command is critical. Enabling an incorrect failover mode can cause loss of data and incur system down time.

Verify the original failover configuration and use the appropriate SET command to restore this configuration.

12. Reestablish the dual-redundant configuration with one of the following commands:

```
CLEAR CLI
SET FAILOVER COPY=THIS_CONTROLLER
or
CLEAR CLI
SET MULTIBUS_FAILOVER COPY=THIS_CONTROLLER
```

This command copies the subsystem configuration from “this controller” to the “other controller.”

IMPORTANT: Wait until the following message is displayed before proceeding:

```
"[DATE] [TIME]-- OTHER CONTROLLER RESTARTED"
```

13. Once the replacement ECB status LED turns ON, disconnect the ECB Y-cable from the old ECB.
14. For dual ECB replacement:
 - a. If the “other controller” cache module will be connected to the replacement dual ECB, connect the PC or terminal to the “other controller” maintenance port.

The connected controller now becomes “this controller.”
 - b. Repeat [step 2](#) through [step 13](#).
15. Place the old ECB in an antistatic bag or on a grounded antistatic mat.
16. Disconnect the PC or terminal from the controller maintenance port.

HSG60 and HSG80 Controller Configurations

Use the following steps and [Figure 1](#) through [Figure 5](#), as appropriate, to replace an ECB in single-controller and dual-redundant controller configurations using FRUTIL:

1. Connect a PC or terminal to the maintenance port of the controller that has the defective ECB.

The controller connected to the PC or terminal becomes “this controller.”
2. For StorageWorks Model 2100 and 2200 enclosures, enter the following command to verify that system time is set:
3. If system time is not set or current, enter current data using the following command:

```
SHOW_THIS_CONTROLLER_FULL
```

```
SET_THIS_CONTROLLER
TIME=dd-mm-yy:hh:mm:ss
```

IMPORTANT: An internal clock monitors the life of the ECB battery. This clock must be reset after replacing an ECB.

4. Start FRUTIL with the following command:

```
RUN FRUTIL
```
5. Continue this procedure as determined by the enclosure type:
 - [StorageWorks Model 2100 and 2200 enclosures](#)
 - [All other supported enclosures](#)

StorageWorks Model 2100 and 2200 enclosures

- a. Follow on-screen instructions to replace the ECB.



CAUTION: Make sure to install the replacement ECB in a bay that supports the same cache module as the current ECB being removed (see [Figure 4](#)).

Remove the blank bezel from this replacement bay and reinstall the blank bezel in the bay vacated by the current ECB. Failure to reinstall the blank bezel might cause an over temperature condition and damage the enclosure.

- NOTE:** Install a Battery Service Label on the replacement ECB prior to installing the ECB in the enclosure. This label indicates the installation date (MM/YY) for the replacement ECB.
- b. Install a Battery Service Label on the replacement ECB as described by the *Compaq StorageWorks ECB Battery Service Label Placement* installation card.
 - c. Remove the blank bezel from the appropriate bay and install the replacement ECB.

IMPORTANT: Do not remove the old ECB until the ECB charged LED on the replacement ECB turns ON (see [Figure 3](#), ❶).
 - d. Remove the old ECB and install the blank bezel in this bay.
 - e. Press **Enter/Return**.

The ECB expiration date and deep discharge history are updated.
FRUTIL exits.
 - f. Disconnect the PC terminal from the controller maintenance port.

- g. Repeat this entire procedure to replace the ECB for the “other controller.”

All other supported enclosures



CAUTION: Make sure that at least one ECB is connected to the ECB Y-cable at all times during this procedure. Otherwise, cache memory data is not protected and is subject to loss.

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

- a. Follow on-screen instructions concerning availability and replacement questions for the ECB.

NOTE: If an empty bay is not available, place the replacement ECB on top of the enclosure or at the bottom of the rack.

- b. Insert the replacement ECB into an appropriate bay or near the ECB being removed.
c. Follow on-screen instructions to connect the ECB.
d. Disconnect the ECB Y-cable from the old ECB.
e. Press **Enter/Return**.

IMPORTANT: Wait for FRUTIL to terminate.

- f. For single ECB replacement:

- 1) Remove the old ECB and place the ECB in an antistatic bag or on a grounded antistatic mat.
2) If the replacement ECB was not placed within an available bay, install the ECB into the vacant bay of the old ECB.

- g. For dual ECB replacement, if the other cache module is also to be connected to the new dual ECB, connect the PC or terminal to the “other controller” maintenance port.

The connected controller now becomes “this controller.”

- h. Repeat [step d](#) through [step g](#) as required.
i. Disconnect the PC terminal from the controller maintenance port.

HSJ80 Controller Configurations

Use the following steps and [Figure 1](#) through [Figure 5](#), as appropriate, to replace an ECB in single-controller and dual-redundant controller configurations using FRUTIL:

1. Connect a PC or terminal to the maintenance port of the controller that has the defective ECB.

The controller connected to the PC or terminal becomes “this controller.”

2. Enter the following command to verify that system time is set:

```
SHOW THIS_CONTROLLER FULL
```

3. If system time is not set or current, if desired, enter current data using the following command:

```
SET THIS_CONTROLLER  
TIME=dd-mm-yy:hh:mm:ss
```

IMPORTANT: An internal clock monitors the life of the ECB battery. This clock must be reset after replacing an ECB.

4. Start FRUTIL with the following command:

```
RUN FRUTIL
```

5. Enter **Y(es)** to confirm the intent to replace the “this controller” ECB.
6. Continue this procedure as determined by the enclosure type:

- [StorageWorks Model 2100 and 2200 enclosures](#)
- [All other supported enclosures](#)

StorageWorks Model 2100 and 2200 enclosures

NOTE: Install a Battery Service Label on the replacement ECB prior to installing the ECB in the enclosure. This label indicates the installation date (MM/YY) for the replacement ECB.

- a. Install a Battery Service Label on the replacement ECB as described by the *Compaq StorageWorks ECB Battery Service Label Placement* installation card.
b. Follow on-screen instructions to replace the ECB.



CAUTION: Make sure to install the replacement ECB in a bay that supports the same cache module as the current ECB being removed (see [Figure 4](#)).

Remove the blank bezel from this replacement bay and reinstall the blank bezel in the bay vacated by the current ECB. Failure to reinstall the blank bezel might cause an over temperature condition and damage the enclosure.

Do not remove the old ECB until the ECB charged LED on the replacement ECB turns ON (see [Figure 3](#), ●).

The ECB expiration date and deep discharge history are updated.

FRUTIL exits.

- c. Disconnect the PC terminal from the controller maintenance port.
d. Repeat this entire procedure to replace the ECB for the “other controller,” if necessary.

All other supported enclosures



CAUTION: Make sure that at least one ECB is connected to the ECB Y-cable at all times during this procedure. Otherwise, cache memory data is not protected and is subject to loss.

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

NOTE: If an empty bay is not available, place the replacement ECB on top of the enclosure or at the bottom of the rack.

- a. Insert the replacement ECB into an appropriate bay or near the ECB being removed.

- b. Follow on-screen instructions to connect the ECB.
See [Figure 4](#) for the location of the Cache A (7) and Cache B (8) modules. The relative locations of controllers and cache modules are similar for all enclosure types.

FRUTIL exits. The ECB expiration date and deep discharge history are updated.

IMPORTANT: Wait for FRUTIL to terminate.

- c. Following single ECB replacement:
 - 1) Remove the old ECB and place the ECB in an antistatic bag or on a grounded antistatic mat.
 - 2) If the replacement ECB was not placed within an available bay, install the ECB into the vacant bay of the old ECB.
- d. Following dual ECB replacement, if the other cache module is also to be connected to the new dual ECB, connect the PC or terminal to the “other controller” maintenance port.
The connected controller now becomes “this controller.”
- e. Repeat [step 4](#) through [step d](#) as required.
- f. Disconnect the PC terminal from the controller maintenance port.

NOTE: If an empty bay is not available, place the replacement ECB on top of the enclosure or at the bottom of the rack.

- 6. Insert the replacement ECB into an appropriate bay or near the ECB being removed.
- 7. Follow on-screen instructions to connect the ECB.
See [Figure 4](#) for the location of the Cache A (7) and Cache B (8) modules. The relative locations of controllers and cache modules are similar for all enclosure types.
FRUTIL exits. The ECB expiration date and deep discharge history are updated.

IMPORTANT: Wait for FRUTIL to terminate.

- 8. Following single ECB replacement:
 - a. Remove the old ECB and place the ECB in an antistatic bag or on a grounded antistatic mat.
 - b. If the replacement ECB was not placed within an available bay, install the ECB into the vacant bay of the old ECB.
- 9. Following dual ECB replacement, if the other cache module is also to be connected to the new dual ECB, connect the PC or terminal to the “other controller” maintenance port.
The connected controller now becomes “this controller.”
- 10. Repeat [step 4](#) through [step 9](#) as required.
- 11. Disconnect the PC terminal from the controller maintenance port.

HSZ80 Controller Configurations

Use the following steps and [Figure 1](#) through [Figure 5](#), as appropriate, to replace an ECB in single-controller and dual-redundant controller configurations using FRUTIL:

- 1. Connect a PC or terminal to the maintenance port of the controller that has the defective ECB.
The controller connected to the PC or terminal becomes “this controller.”
- 2. Enter the following command to verify that system time is set:
`SHOW THIS_CONTROLLER FULL`
- 3. If system time is not set or current, enter current data using the following command:
`SET THIS_CONTROLLER
TIME=dd-mm-yyy:hh:mm:ss`
IMPORTANT: An internal clock monitors the life of the ECB battery. This clock must be reset after replacing an ECB.
- 4. Start FRUTIL with the following command:
`RUN FRUTIL`
- 5. Enter **Y(es)** to confirm the intent to replace the “this controller” ECB.

Hot-Pluggable Procedure for StorageWorks Model 2100 and 2200 Enclosures

For HSG60, HSG80, and HSJ80 controller configurations with FRUTIL support, follow the applicable controller procedure previously addressed. For a hot-pluggable ECB replacement, use the procedure in this section.

IMPORTANT: The pluggable procedure (used in the HSG60, HSG80, HSJ80, and HSZ80 controller sections) uses FRUTIL to update the ECB battery expiration date and deep discharge history.
The hot-pluggable procedure in this section replaces the ECB only and *does not* update ECB battery history data.

Use the following procedure to replace an ECB as a hot-pluggable device:

- 1. Using [Figure 4](#), determine the specific bay to install the ECB.
NOTE: Make sure this bay supports the same cache module (A or B) as the ECB being removed.
- 2. Press the release tab and pivot the lever downward on the replacement ECB.
- 3. Remove the blank panel from the appropriate vacant bay (A or B).
- 4. Align and insert the replacement ECB into the vacant bay until the lever engages the enclosure (see [Figure 5](#)).
- 5. Lift the lever upward until the lever locks.



CAUTION: Make sure that at least one ECB is connected to the ECB Y-cable at all times during this procedure. Otherwise, cache memory data is not protected and is subject to loss.
The ECB Y-cable has a 12-volt and a 5-volt pin. Improper handling or misalignment when connecting or disconnecting might cause these pins to contact ground, resulting in cache module damage.

6. If enclosure power is applied, verify that the LED displays a **Charge Test** state (see [Figure 3](#) for LED locations and [Table 1](#) for the proper display state).
7. Following ECB initialization, verify that the LEDs display either a **Charging** or **Charged** state (see [Figure 3](#) for LED locations and [Table 1](#) for the proper display state).
8. Press the release tab on the old ECB and pivot the lever downward.
9. Remove the old ECB from the enclosure.
10. Install the blank panel in the vacant ECB bay.

Updated StorageWorks Model 2100 and 2200 Enclosure ECB LED Definitions

[Table 1](#) replaces Table 6–1 “ECB Status LED Displays” in the *Compaq StorageWorks Model 2100 and 2200 Ultra SCSI Controller Enclosure User Guide*.

IMPORTANT: Make sure to identify the existence of this updated table in the user guide.

Table 1: ECB Status LED Displays

LED Display	ECB State Definition
	<p>Startup: Checking temperature and voltage. If this state persists for more than 10 seconds, then a temperature fault exists.</p> <p>Backup: When power is removed, a low duty cycle FLASH indicates normal operation.</p>
	Charging: The ECB is charging the battery.
	Charged: The ECB battery is charged.
	Charge Test: The ECB is ascertaining whether the battery is capable of holding a charge.
 	<p>Temperature Fault Indications:</p> <ul style="list-style-type: none"> • When this indication displays, the ECB battery charging is suspended until the temperature fault has been corrected. • When this indication displays, the ECB battery is still capable of backup.
	ECB Fault: Indicates the ECB has faulted.
	Battery Fault: The ECB determined the battery voltage is incorrect or the battery is missing.
  	<p>LED Legend:</p> <p>OFF</p> <p>FLASHING</p> <p>ON</p>