

# Instructions

## hp StorageWorks Adding M5314 Drive Enclosures to an EVA5000 Configuration

*Read instructions completely before  
beginning the installation procedure*



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Adding M5314 Drive Enclosures to an EVA5000 Configuration  
Instructions  
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## About this document

This guide tells you how to add an M5314<sup>1</sup> drive enclosure to an existing EVA5000 rack with FC loop switches, while the EVA5000 is running and in production. You can add M5314 drive enclosures to EVA3000 and EVA5000 racks without FC loop switches while the storage system is shut down.

## Adding M5314 drive enclosures to an EVA5000 configuration

**Note:** HP highly recommends adding the FC drive enclosures to an EVA5000 in pairs to maintain a balanced load on the controllers.

All M5314 drive enclosure kits now include copper FC cables. Therefore, when you expand an existing EVA5000 rack, your configuration will contain both copper and fiber optic FC cables. The copper FC cables are functionally equivalent to fiber optic FC cables. The Enterprise Virtual Array transfers all data at the 2Gb/sec rate, and there is no performance difference between fiber optic FC cables and copper FC cables.



**WARNING:** An assembled drive enclosure (with all elements installed) weighs more than 29.5 kg (65 lb) and requires a minimum of two people to move. To safely and easily install the drive enclosure, remove the drives, power supplies, blowers, EMU, and I/O modules. This reduces the drive enclosure weight to approximately 11.0 kg (24 lb). Even though a single person can lift this weight, the drive enclosure is difficult to install because of the physical size. Therefore, HP recommends that a minimum of two people install an empty drive enclosure in a rack.

Before you begin this hardware upgrade, you must verify that the Enterprise Virtual Array is functioning properly. Use Command View EVA to verify that each drive enclosure and disk drive has a good operational status. If a drive enclosure or disk drive does not have a good operational status, correct the problem.

To add a new drive enclosure to an EVA5000 rack, perform the following steps:

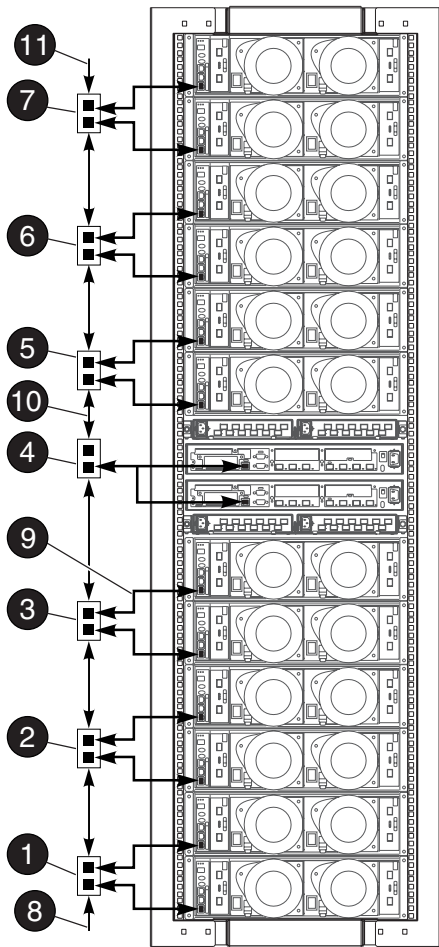
1. Label each new FC cable with the labels contained in the drive enclosure kit. Each drive enclosure kit has two FC copper cables. Use the labeling scheme described in [Table 1](#).

**Table 1: FC cable labels**

Drive Enclosure	FC Cable Labels
4	11 and 17
5	12 and 18
6	13 and 19
12	23 and 29
13	24 and 30
14	25 and 31

1. You can use this procedure for M5214 and M5114 drive enclosures as well.

2. Uninstall the junction boxes near the desired drive enclosure location. Refer to [Table 2](#) for the junction box numbers.



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- ❶ JB 1—Enclosures 1 and 2
- ❷ JB 2—Enclosures 3 and 4
- ❸ JB 3—Enclosures 5 and 6
- ❹ JB 4—Enclosure 7
- ❺ JB 5—Enclosures 9 and 10
- ❻ JB 6—Enclosures 11 and 12
- ❼ JB 7—Enclosures 13 and 14 Components
- ❽ Bottom terminator
- ❾ JB-to-Enclosure cable  
381 mm (15 in), 1 of 13 cables
- ❿ JB-to-JB cable  
210 mm (8.25 in), 1 of 6 cables
- ⓫ Top terminator

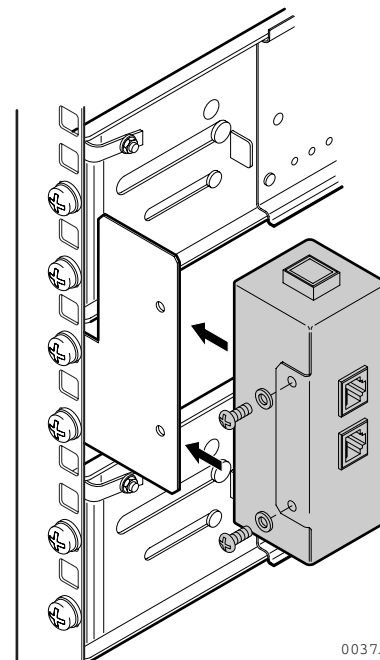
**Figure 1: Enclosure address bus components in a 41U rack**

- a. Loosen and remove the two mounting screws.
- b. Slide the junction box off the rail.

**Table 2: Uninstall junction box**

If installing Drive Enclosure	Uninstall Junction Box
4	2 and 3
5	2 and 3
6	2 and 3
12	6 and 7
13	6 and 7
14	6 and 7

3. If an FC cable loop is near the junction box, carefully turn the captive fastener 1/4 turn and slide the cable spool off of the rail. Carefully, let the spool hang.
4. Remove the nearby velcro cable ties.
5. Cut the plastic ties on the drive enclosure power cables.
6. Install the snap-in rail kit.
7. Install the enclosure address bus adapter brackets for the junction boxes that you removed from the rails.



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**Figure 2: Enclosure address bus adapter bracket and junction box**

8. Attach the junction boxes to the adapter brackets.



**Caution:** Do not overtorque the screws. The screws that connect the junction box to the adapter bracket are 9 in/lb screws.

9. Physically install the drive enclosure into the EVA5000 rack, but do not connect the cables.
10. Insert and seat all drives into the drive enclosure.



**WARNING:** To avoid lifting excessive weight, please perform [step 9](#) and [step 10](#) separately.

11. Connect the newly added drive enclosure to the enclosure address bus. Refer to [Table 3](#) for the correct enclosure address bus ports.

**Table 3: Enclosure address bus ports**

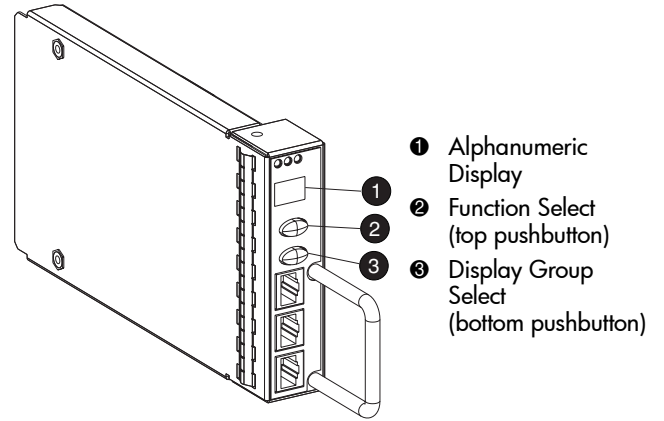
Drive Enclosure	Enclosure Address Bus Port
4	4
5	5
6	6
12	11
13	12
14	13

12. Connect the AC power to the drive enclosure.

- a. Wait for all FC disk drives to spin up.

**Note:** The first drive in the drive enclosure might have the orange Drive Failure icon lit. This is expected behavior.

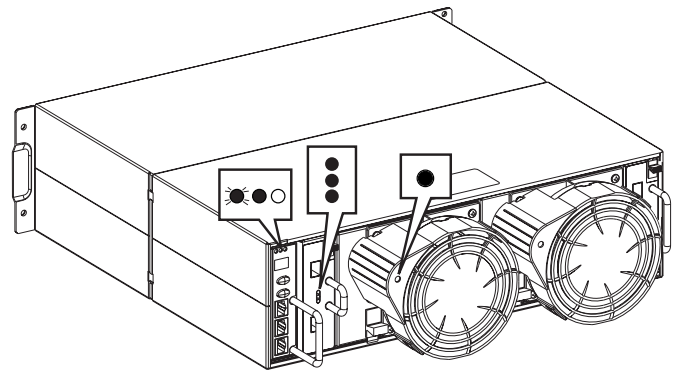
- b. Check the EMU 7-segment display for errors. Resolve any errors.



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**Figure 3: Alphanumeric display and controls**

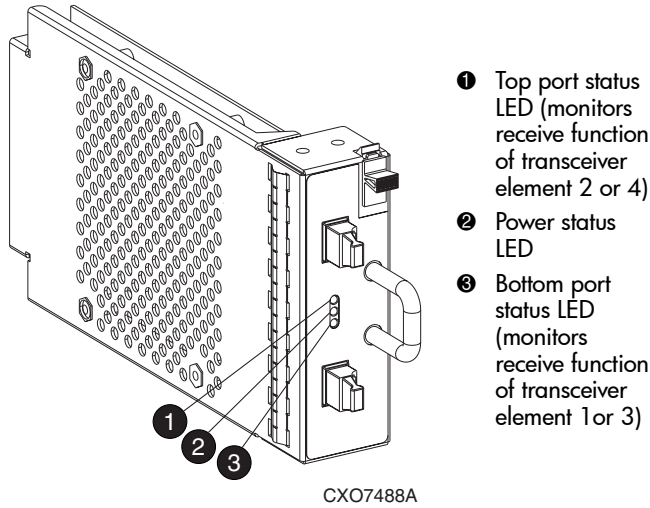
- c. Verify that the EMU displays a unique enclosure number.
- d. Verify that the EMUs on the other drive enclosures continue to display valid enclosure numbers.
- e. Verify that the Fan LEDs are on and steady.



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**Figure 4: Typical operational status LED displays—enclosure rear**

- f. On both the A and the B I/O modules, verify that the Power LED is on and steady. Verify that the Port 1 and Port 2 LEDs are off.



- ❶ Top port status LED (monitors receive function of transceiver element 2 or 4)
- ❷ Power status LED
- ❸ Bottom port status LED (monitors receive function of transceiver element 1 or 3)

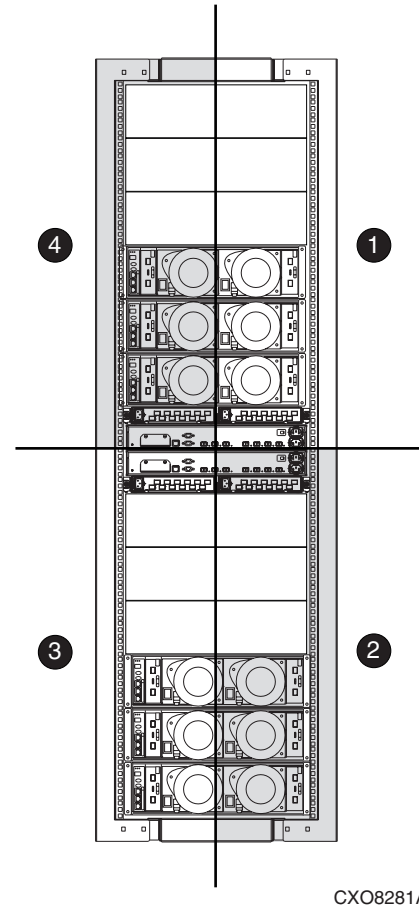
**Figure 5: I/O module status LEDs**

- g. Resolve any errors before proceeding to the next step.
- 13. Check the operational status of the FC loops.
  - a. On the controller, verify that the A-side device port LEDs are on and steady.
  - b. On the controller, verify that the B-side device port LEDs are on and steady.
  - c. Resolve any problems before proceeding to the next step.

14. Remove GBICs from the required ports on the A and B loop switches.

15. Using a copper FC cable, connect the A I/O module to the upper or lower A-side loop switch. The A-side of the rack is the right side of the rack, when viewed from the rear. (See Figure 6 and refer to Table 4 on page 5 to determine which cables and port connections to use.)

The location of the drive enclosure in the rack determines to which loop switches it connects. Drive enclosures mounted in the lower half of the rack (enclosures 1 through 6) connect to loops 1A and 1B. Drive enclosures mounted in the upper half of the rack (enclosures 9 through 14) connect to loops 2A and 2B.



- ❶ Loop 2A
- ❷ Loop 1A
- ❸ Loop 1B
- ❹ Loop 2B

**Figure 6: Loop locations in the Enterprise rack**

- a. Plug the GBIC into the correct port on the A-side loop switch.
- b. Route the copper cable through the appropriate cable management arm and radial clip. Do not route the copper cables through flumes that contain fiber optic cables. Instead, route the copper cables through vacant flumes.



**Caution:** When you are adding the copper cables to the rack, handle the fiber optic cables with care. If you are not careful, you can damage the fiber optic cables.

- c. Coil the excess copper cable and secure the cable behind the rail with cable ties.

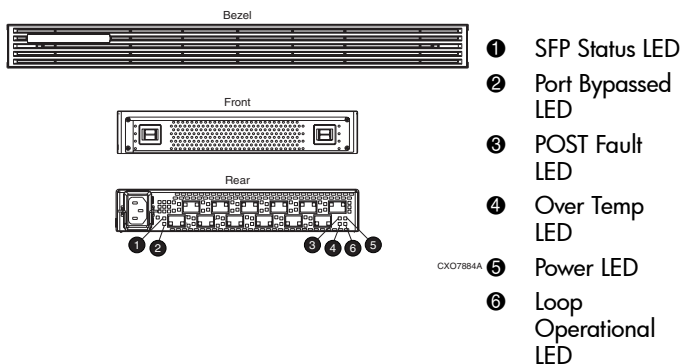
- d. Plug the GBIC into the A I/O module of the drive enclosure.

**Table 4: FC cable connections for I/O module A**

Drive Enclosure	I/O Module	FC Cable	FC Loop Switch	FC Loop Switch Port
4	A	11	1A	6
5	A	12	1A	4
6	A	13	1A	2
12	A	23	2A	7
13	A	24	2A	9
14	A	25	2A	11

16. Verify that the FC connection is operating correctly.

- a. Verify that the green SFP Status LED on the FC loop switch is on and steady.



**Figure 7: Fibre Channel loop switch LEDs**

- b. Verify that the corresponding Port LED on the A I/O module is on and steady.
- c. Verify that the corresponding A device port on the controller is on and steady.

**Note:** The orange Drive Failure icon on first drive in drive enclosure is turned off.

- d. Verify that the upgraded configuration is working properly, using Command View EVA.
    - Click the icon for the added drive enclosure in the Navigation pane. Verify that the added drive enclosure has a good status.
    - Clicking the disk drive icons in the Navigation pane, verify that each disk drive in the added drive enclosure has a good status.
  - e. Resolve any problems before proceeding to the next step.
17. Using a copper FC cable, connect the B I/O module to the upper or lower B-side loop switch. The B-side of the rack is the left side of the rack, when viewed from the rear. (Refer to [Table 5](#) to determine which cables and port connections to use.)

**Caution:** Make sure you are connecting the drive enclosure to corresponding loop switches. If you used loop switch 1A in [step 15](#), then you must use loop switch 1B. If you used loop switch 2A, then you must use loop switch 2B. If you fail to connect the drive enclosure to corresponding loop switches, you can make the data in the other drive enclosures inaccessible.

- a. Plug the GBIC into the correct port on the B-side loop switch.
- b. Route the copper cable through appropriate cable management arm and radial clip. Do not route the copper cables through flumes that contain fiber optic cables. Instead, route the copper cables through vacant flumes.

**Caution:** When you are adding the copper cables to the rack, handle the fiber optic cables with care. If you are not careful, you can damage the fiber optic cables.

- c. Coil the excess copper cable and secure the cable behind the rail with cable ties.
- d. Plug the GBIC into the B I/O module of the drive enclosure.

**Table 5: FC cable connections for I/O module B**

Drive Enclosure	I/O Module	FC Cable	FC Loop Switch	FC Loop Switch Port
4	B	17	1B	8
5	B	18	1B	10
6	B	19	1B	12
12	B	29	2B	5
13	B	30	2B	3
14	B	31	2B	1

18. Verify that the FC connection is operating correctly.

- a. Verify that the green SFP Status LED on the FC loop switch is on and steady.
- b. Verify that the corresponding Port LED on the B I/O module is on and steady.
- c. Verify that the corresponding B device port on the controller is on and steady.
- d. Wait 15 minutes.
- e. Verify that Command View EVA displays the recently added drive enclosure under the Rack element in the Navigation pane. It should no longer be in the *Unmappable Hardware* folder.
- f. Verify that the upgraded configuration is working properly, using Command View EVA.
  - Click the icon for the added drive enclosure in the Navigation pane. Verify that the added drive enclosure has a good status.

- Clicking the disk drive icons in the Navigation pane, verify that each disk drive in the added drive enclosure has a good status.
  - g. Resolve any problems before proceeding to the next step.
19. Repeat [step 1](#) through [step 18](#) to add each drive enclosure.
  20. Use nylon ties to secure the copper FC cables. Use velcro ties to secure the fiber optic FC cables.
  21. In Command View EVA, configure the additional storage capacity. Refer to the *HP StorageWorks Enterprise Virtual Array User Guide* and *EVA Best Practices* for information about configuring an EVA.