How to Replace Hard Disk Backplane for 8 bay/5 bay DiskStation
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Revision History

<table>
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<th>Revision Number</th>
<th>Date of Issue</th>
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<th>By</th>
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<tr>
<td>v.1.0</td>
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</tr>
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How to Replace Hard Disk Backplane for 8 bay/5 bay DiskStation

1. Introduction

This SOP explains about the detailed steps for replacing hard disk backplane (“HDD backplane”) on Synology’s 8 bay/5 bay DiskStation products.

1.1 Applied Models & Required Components

- HDD backplane of the DiskStation model for replacing:

<table>
<thead>
<tr>
<th>Required Module</th>
<th>Item Code</th>
<th>Description</th>
<th>Applied Model</th>
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</thead>
<tbody>
<tr>
<td>SATA Backplane</td>
<td>80-18TBP0010</td>
<td>ASSY PCBA DS1812+ BP SYNODYLOGY V1.0</td>
<td>DS1813+ DS1812+</td>
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<tr>
<td></td>
<td>80-1512PSB11</td>
<td>ASSY PCBA DS1512+ SATA BOARD SYNODYLOGY V1.1</td>
<td>DS1513+ DS1512+ DX513 (*)</td>
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<tr>
<td></td>
<td>80-D510PSB14</td>
<td>ASSY PCBA DS1010+ SATA BOARD SYNODYLOGY V1.4</td>
<td>DS1511+ DX513 (*) DX510</td>
</tr>
</tbody>
</table>

*Note: For DX513, consult Synology for further information about the correct backplane version before proceeding to replace.*

▲ HDD Backplane for DS1813+ (Metal Frame Included)
1.2 Required Tools

- Screw Driver “+” Type: Suggested Bit Size PH#2  
  Note: If an automatic screwdriver is used, set its torque reading to be 4.5 (+/-0.2) kg/cm in advance.
- Anti-static / Cotton Gloves
2. Start to Replace

*Note: DS1813+ is hereunder the common example unless otherwise specified.*

2.1 Dismantle the defective HDD backplane

2.1.1 Release the six (6) screws on the rear panel (Marked by the red circles). (Fig. 1)

![Fig. 1](image1)

2.1.2 Draw backwards then move up the enclosure cover to remove it. (Fig. 2)

![Fig. 2](image2)
2.1.3 Release the three (3) screws on the enclosure bottom (Marked by the red circles). (Fig. 3)

2.1.4 Release the four (4) screws on the rear panel (Marked by the red circles). (Fig. 4)
2.1.5 Remove the rear panel from the enclosure. (Fig. 5)

Fig. 5

2.1.6 Unplug the two (2) fan cable connectors (Marked by the red rectangles) which attach to the eSATA board. (Fig. 6)

Fig. 6
2.1.7 Remove all the disk trays from the HDD chassis. (Fig. 7)

![Fig. 7](image.png)

2.1.8 For DS1813+, DS1812+:
Release the screw on the enclosure bottom (Marked by the red circles). (Fig. 8)

![Fig. 8](image.png)
2.1.9 Unplug the eSATA board cable connector(s) (Marked by the red rectangle) from the motherboard. (Fig. 9 for DS1813+, DS1513+, DX513 and Fig. 10 for DS1812+, DS1512+, DS1511+, DX513 and DX510):

Fig. 9 – For DS1813+, DS1513+, DX513

Fig. 10 – For DS1812+, DS1512+, DS1511+, DX513, DX510
2.1.10 Release the five (5) screws (Marked by the red circles). (Fig. 11)

2.1.11 Then remove the motherboard from the chassis. (Fig. 12)
2.1.12 Unplug the 24-pin PSU cable connector and LED cable connector (Marked by the red rectangles) from the motherboard. (Fig. 13 for DS1813+, DS1513+, DX513 (*), Fig. 14 and 15 for DS1812+, DS1512+, DS1511+, DX513 (*), DX510)

**Note:** For DX513, proceed this step as shown in Fig. 13 or Fig. 14/15 by the location of its LED cable connector.

Fig. 13 - For DS1813+, DS1513+, DX513

Fig. 14 - For DS1812+, DS1512+, DS1511+, DX513, DX510
2.1.13 Place some cushion material (For example, EPE sheets) on top of the HDD chassis. (Fig. 16)
2.1.14 Release the two (2) screws (Marked by the red circles) which fix the PSU. (Fig. 17 for DS1813+ and DS1812+, Fig. 18 for DS1513+, DS1512+, DS1511+, DX513 and DX510).

Fig. 17 – For DS1813+, DS1812+

Fig. 18 – For DS1513+, DS1512+, DS1511+, DX513 and DX510
2.1.15 Release the two (2) screws (Marked by the red circles) which fix the PSU. (Fig. 19 for DS1813+ and DS1812+, Fig. 20 for DS1513+, DS1512+, DS1511+, DX513 and DX510). Then remove the PSU bracket(s).
2.1.16 Remove the PSU from the enclosure then flip it up with its top side lain on the cushion. (Fig. 21)

![Fig. 21](image)

2.1.17 Unplug the 12-pin and 8-pin PSU cable connectors (Marked by the red rectangle). (Fig. 22)

![Fig. 22](image)
2.1.18 For DS1813+, DS1812+:
- Release the three (3) screws (Marked by the red circles) which fix the eSATA board. (Fig. 23 and Fig. 24) Then remove the eSATA board.

Fig. 23

Fig. 24
- Release the four (4) screws (Marked by the red circles) which fix the defective HDD backplane assembly. (Fig. 25)

- Remove the defective HDD backplane assembly. (Fig. 26)
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- Release the screw on top of the upper metal frame (Marked by the red circles). (Fig. 27)

![Fig. 27](image)

- Release the four (4) screws (Marked by the red circles) to remove the defective HDD backplane from the two sets of metal frame. (Fig. 28)

![Fig. 28](image)
Fig. 29 shows the status after the defective HDD backplane is removed from the two metal frame sets.

2.1.19 For DS1513+, DS1512+, DS1511+, DX513 and DX510:
- Release the five (5) screws (Marked by the red circles) which fix the defective HDD backplane. (Fig. 30 and Fig. 31)
Bring the defective HDD backplane through the opening on the HDD chassis to remove it. (Fig. 32) Do not damage the aluminum foil pasted on the HDD chassis when moving the backplane.
Fig. 33 shows the status after the defective HDD backplane is removed from the HDD chassis.
2.2 Install the replacement HDD backplane

2.2.1 For DS1813+, DS1812+:

- Insert the bottom edge of the replacement HDD backplane to the space between the two lower metal frames. Then fix the two (2) screws (Marked by the red circles) to secure them together. (Fig. 34)

- Assemble the replacement HDD backplane (Top edge) and the two upper metal frames. Then fix the two (2) screws (Marked by the red circles) to secure them together. (Fig. 35)
- Fix the screw on top of the upper metal frame (Marked by the red circles). (Fig. 36)

- Insert the replacement HDD backplane assembly to the same location of the defective one in the enclosure. (Fig. 37)
Fix the four (4) screws (Marked by the red circles). (Fig. 38)

Restore the eSATA board to its original location in the enclosure. Then fix the three (3) screws (Marked by the red circles) to secure it. (Fig. 39 and Fig. 40)
2.2.2 For DS1513+, DS1512+, DS1511+, DX513 and DX510:

- Insert the replacement HDD backplane to the same location of the defective one in the enclosure. (Fig. 41) Do not damage the aluminum foil pasted on the HDD chassis when moving the backplane.
Fix the five (5) screws (Marked by the red circles) to secure the replacement HDD backplane. (Fig. 42 and Fig. 43)
2.2.3 Plug back the 12-pin and 8-pin PSU cable connectors (Marked by the red rectangle) to their original locations on the HDD backplane. (Fig. 44)

2.2.4 Restore the PSU to its original location in the enclosure. (Fig. 45)
2.2.5 Restore the PSU bracket(s) to the original location(s). Then fix the two (2) screws (Marked by the red circles) to secure the bracket(s)/PSU. (Fig. 46 for DS1813+ and DS1812+, Fig. 47 for DS1513+, DS1512+, DS1511+, DX513 and DX510)

Fig. 46 – For DS1813+, DS1812+

Fig. 47 – For DS1513+, DS1512+, DS1511+, DX513 and DX510
2.2.6 Fix the two (2) screws (Marked by the red circles) to secure the bracket(s)/PSU. (Fig. 48 for DS1813+ and DS1812+, Fig. 49 for DS1513+, DS1512+, DS1511+, DX513 and DX510) Then remove the cushion.

Fig. 48 – For DS1813+, DS1812+

Fig. 49 – For DS1513+, DS1512+, DS1511+, DX513 and DX510
2.2.7 Plug back the 24-pin PSU cable connector and LED cable connector (Marked by the red rectangles) to their original locations on the motherboard. (Fig. 50 for DS1813+, DS1513+, DX513 (*), Fig. 51 and Fig. 52 for DS1812+, DS1512+, DS1511+, DX513 (*), DX510)

Note: For DX513, proceed this step as shown in Fig. 50 or Fig. 51/52 by the location of its LED cable connector.
2.2.8 To restore the motherboard into the enclosure, there are two (2) locations as follow for joining the two sides:

<table>
<thead>
<tr>
<th>Motherboard Side (Fig. 53)</th>
<th>Enclosure Side (Fig. 54)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 PCI Express connector (Large)</td>
<td>#2 Bonding finger of the HDD backplane</td>
</tr>
<tr>
<td>#3 PCI Express connector (Small)</td>
<td>#4 Bonding finger of the eSATA board</td>
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Fig. 54 – Enclosure Side

restore the motherboard to its original location in the chassis. (Fig. 55)

Fig. 55
2.2.9 Join the motherboard and the enclosure together with the followings (Fig. 56):
- The bonding finger of the HDD backplane (#2) inserted into the PCI Express connector (Large) (#1) properly.
- The bonding finger of the eSATA board (#4) inserted into the PCI Express connector (Small) (#3) properly.

![Fig. 56](image)

2.2.10 Fix the five (5) screws (Marked by the red circles) to secure the motherboard. (Fig. 57)

![Fig. 57](image)
2.2.11 Plug back the eSATA board cable connector(s) (Marked by the red rectangle) to the original location(s) on the motherboard. (Fig. 58 for DS1813+, DS1513+, DX513 and Fig. 59 for DS1812+, DS1512+, DS1511+, DX513 and DX510):

Fig. 58 – For DS1813+, DS1513+, DX513

Fig. 59 – For DS1812+ (*), DS1512+ (*), DS1511+, DX513, DX510

Note: Fig. 60 and Fig. 61 show how the eSATA board cables are connected with the eSATA board. (Fig. 60 for DS1812+, Fig. 61 for DS1512+) Follow the way when plugging back the eSATA board cable connectors.
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Fig. 60 – For DS1812+

Fig. 61 – For DS1512+
2.2.12 For DS1813+, DS1812+:
Fix the screw on the enclosure bottom (Marked by the red circles) to secure the replacement HDD backplane assembly. (Fig. 62)

2.2.13 Restore all the disk trays into the HDD chassis. (Fig. 63)
2.2.14 Plug back the two (2) fan cable connectors (Marked by the red rectangles) to their original locations on the eSATA board. (Fig. 64)

Fig. 64

2.2.15 Restore the fan panel to the enclosure. (Fig. 65)

Fig. 65
2.2.16 Fix the four (4) screws on the rear panel (Marked by the red circles). (Fig. 66)

2.2.17 Fix the three (3) screws on enclosure bottom (Marked by the red circles) to secure the rear panel. (Fig. 67)
2.2.18 Restore the enclosure cover to its original location. (Fig. 68)

2.2.19 Fix the six (6) screws on the rear panel (Marked by the red circles) to secure the enclosure cover. (Fig. 69)

2.3 The replacing task is completed.