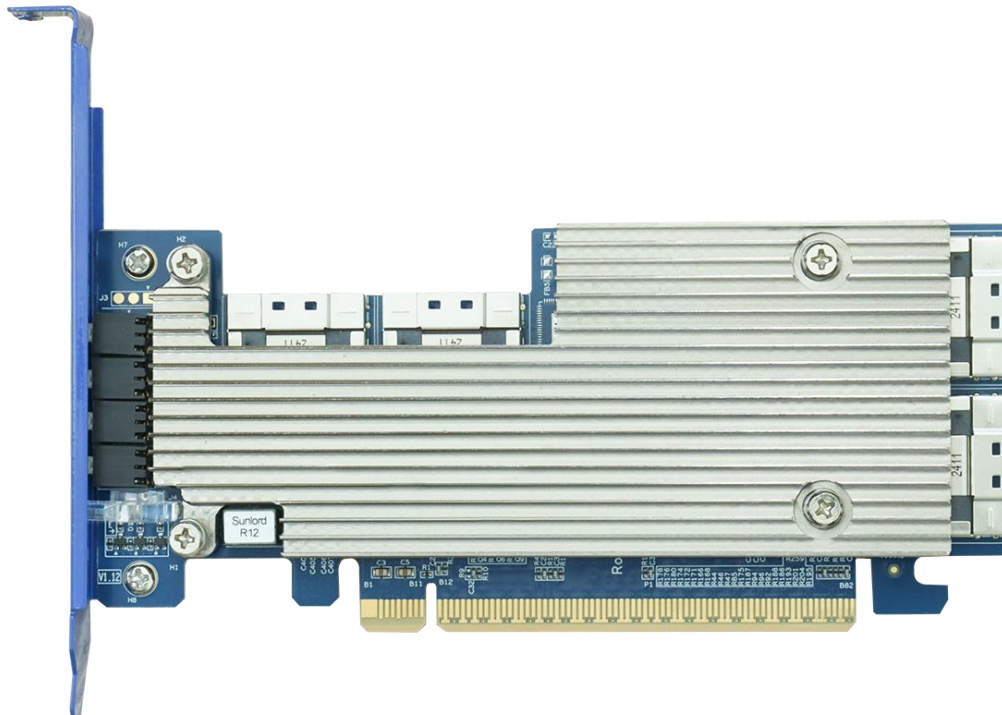




# **Rocket 7528D (R7528D)**

## **NVMe RAID Adapter User Guide**



**V1.03 - June 23, 2025**

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# 1. Overview

The R7528D is the latest member of our PCIe Gen4 NVMe RAID Adapter product family.

HighPoint Rocket Series NVMe connectivity adapters address the needs of solution providers and system integrators that cater to vertical marketplaces for high-speed industrial, corporate, and media applications. They were designed for professional applications that demand uncompromised storage performance, scalability, and adaptability in a compact, easy-to-integrate package that is universally compatible with industry-standard x86-64 (Intel/AMD) platforms.

The R7528D's eight independent device ports can support U.2/U.3 NVMe SSDs via versatile cabling solutions.

All major Windows operating systems and current distributions of Linux support the R7528D. You only need to install the management software. Your NVMe SSDs will be recognized.

## 1.1. Key Features

- Dedicated PCIe 4.0 x16 host interface
- Support data transfer rate 32GB/s
- Provide four internal SlimSAS (SFF-8654 x8) connectors
- Support eight dedicated U.2/U.3 NVMe devices
- Complies with SFF-9402 standard
- Provide a full-height bracket and a low-profile bracket
- True NVMe Hot-Plug & Hot-Swap capability
- FRU Inventory support
- Downstream port containment
- Read tracking
- Synthetic hierarchy
- Software Secure Boot
- Out-Of-band Support - BMC Support
- Complies with SFF-TA-1005 specification for Universal Backplane Management (UBM)
- Support VPP Backplane
- Support LED Management
- Support the following Operating Systems:
  - Windows 11,10/ Server 2022,2019,2016/ Microsoft Hyper-V
  - RHEL/Debian/Ubuntu/Fedora/Proxmox/Rocky Linux (Linux kernel 3.10 and later)

### 1.1.1. FRU

The *Field Replacement Unit (FRU)* ensures smooth operation and efficient maintenance of complex systems. The unit is designed to house and protect vital product data (VPD).

Information fields within a VPD resource type contain a three-byte header and some data. The three-byte header contains a two-byte keyword and a one-byte length. A keyword is a two-character (ASCII) mnemonic that uniquely identifies the information in the field. The last byte of the header is binary and represents the length value (in bytes) of the following data.

In the event of a hardware failure, the *FRU* can be quickly replaced, returning the device to a fully functional state without requiring extensive diagnostics or data recovery. This reduces downtime and minimizes the possibility of data loss, ensuring that critical operations can continue uninterrupted.

The following table describes the details and descriptions of the VPD.

**Table 1: Details and Descriptions of the VPD**

| Key Word | Details                  | Descriptions   |
|----------|--------------------------|--|
| PN       | AIC Part Number          | This keyword is an extension to the Device ID (or Subsystem ID) in the Configuration Space header.   |
| EC       | Engineering Change Level | The characters are alphanumeric and represent the engineering change level for this add-in card.   |
| MN       | Manufacture ID           | This keyword is provided as an extension to the Vendor ID (or Subsystem Vendor ID) in the Configuration Space header. This allows vendors to identify an additional level of detail regarding the sourcing of this device. |
| SN       | Serial Number            | The characters are alphanumeric and represent the unique add-in card Serial Number.  |
| Vx       | Vendor Specific          | This is a vendor-specific item, and the characters are alphanumeric. The keyword's second character (x) can be 0 through 9 or A through Z.<br><br>V0 indicates the Vendor Name<br><br>V1 indicates the Main Chip           |

### 1.1.2. Synthetic Hierarchy

A synthetic hierarchy can be created to isolate the host from these physical PCIe topology changes and errors.

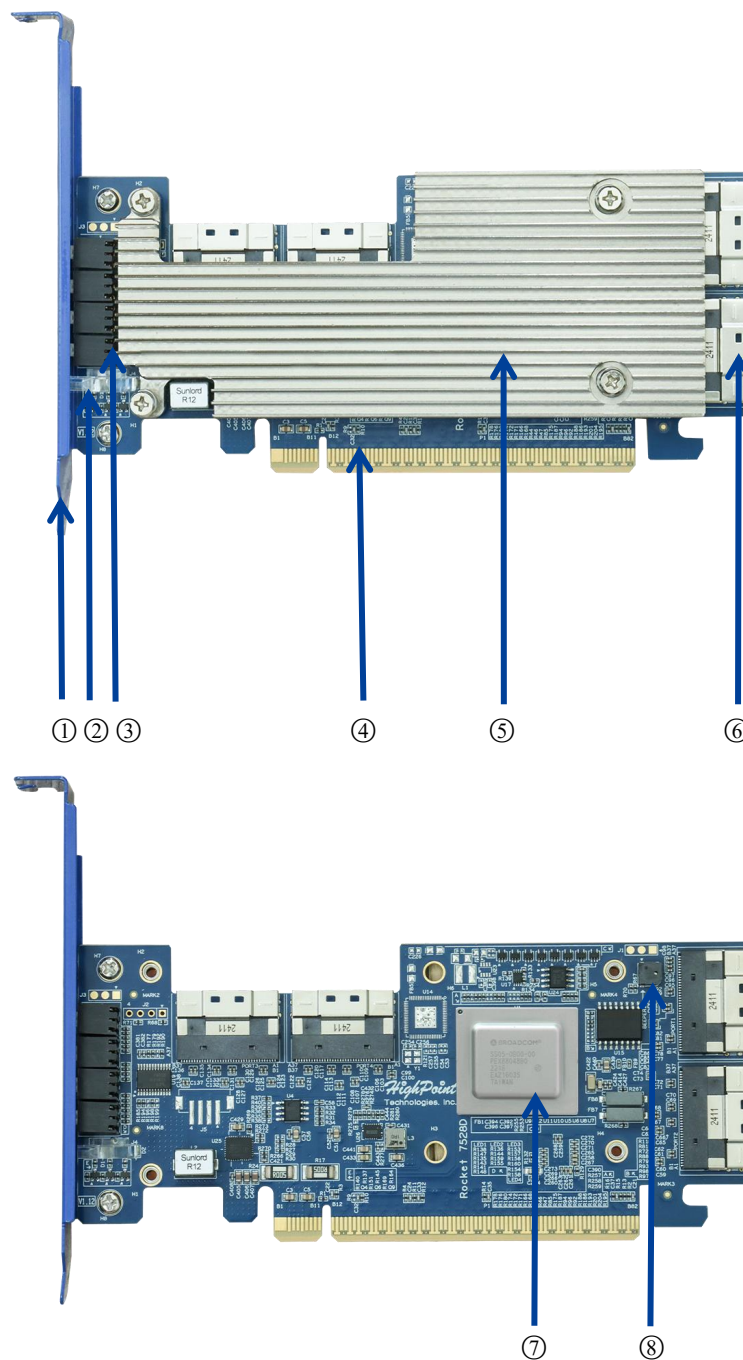
## 2. R7528D Hardware Description

### 2.1. R7528D Layout

The layout of the R7528D is presented in two parts.

#### 2.1.1. Front View

The following figure shows the key components of the R7528D.



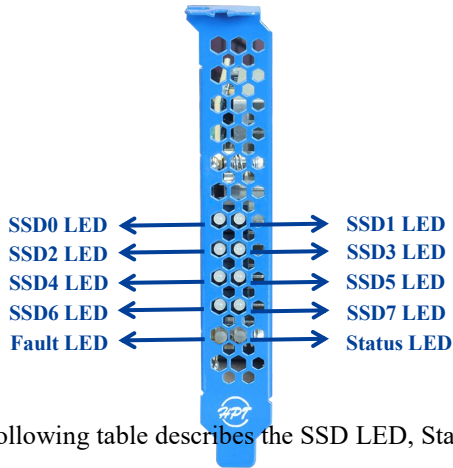
The following table describes the key components of the R7528D.

**Table 2: Key component of the R7528D**

| Number  | Type                | Description  |   |
|---|---------------------|--|---|
| ①   | Bracket             | Full-height bracket (optional low-profile bracket included).<br>The R7528D is secured to the chassis by a bracket.   |   |
| ②   | RGB                 | Status LED and Fault LED. <ul style="list-style-type: none"> <li>● Status LED -- The state of R7528D PCIe bandwidth.</li> <li>● Fault LED -- The state of the Broadcom chipset and SSD temperature.</li> </ul> |   |
| ③   | LED                 | Eight SSD LED. SSD LED indicates the state of SSD.   |   |
| ④   | PCIe Host Interface | PCIe 4.0 x16 host interface. The interface between the R7528D and the host system. With the PCIe interface, this connector provides power to the board.  |   |
| ⑤   | Cooling System      | Passive Heatsink. Used to dissipate heat from electronic components prone to heat generation.  |   |
| ⑥   | Storage Interface   | Four internal SFF-8654 connectors. Connect the R7528D by cable to the storage devices.   |   |
| ⑦   | Chip                | Broadcom PEX 88048 chip.   |   |
| ⑧   | Beeper              | 1-0-1-0-1-0  | The SSD has failed.   |
|   |                     | 1-0-0-1-0-0  | The beeper will chirp when any of the following conditions are triggered. <ul style="list-style-type: none"> <li>● The Broadcom chipset temperature is <math>&gt; 105^{\circ}\text{C}</math>.</li> <li>● The SSD temperature is <math>\geq</math> the SSD warning threshold.</li> </ul> |
|   |                     | 1-1-1-1-1-1  | Both "1-0-1-0-1-0" and "1-0-0-1-0-0" above occur simultaneously.  |
| Note: 1 means alarming, and 0 means not alarming. |                     |  |   |

## 2.1.2. Diagnostic LED View






The following figure shows the LED Indicators of the R7528D.



The following table describes the SSD LED, Status LED, and Fault LED of the R7528D.

**Table 3: Description of LED**

| LED        | Color   | Status   | Description   |
|------------|---|--|---|
| SSD LED    |   | OFF  | The R7528D is powered off, or the SSD is not detected.  |
|            |   | Solid Green  | The SSD is detected.  |
|            |   | Solid Red  | The SSD has failed.   |
|            |   | Fast Flash Red   | The LED blinks red at 4 Hz to indicate the disk's location, which can be accessed through the HighPoint RAID Management Software-- <b>Identify LED</b> function.<br><b>Identify ON</b> means the LED blinks, and <b>Identify OFF</b> means the LED light is restored to its original state. |
|            |   | Interval Flash Red   | The LED blinks red twice in the first second, then goes out for one second and continues to cycle this process. This indicates the disk is greater than or equal to the SSD warning threshold.  |
|            | Slow Flash Red  | The LED blinks red at 1 Hz to indicate that the reinserted disk is in the rebuild state. |   |
| Status LED |   | OFF  | The R7528D is powered off.  |
|            | Notes:<br>The LED blinks at 4 Hz.<br>The following represents the bandwidth status of the R7528D. |  |   |
|            |   | Fast Flash Green   | PCIe 4.0 x16.   |
|            |   | Fast Flash Yellow  | PCIe 4.0 x8 or PCIe 3.0 x16.  |

|                  |   |                         |   |
|------------------|---|-------------------------|---|
|                  |  | <b>Fast Flash Cyan</b>  | PCIe 4.0 x4 or PCIe 3.0 x8.   |
|                  |  | <b>Fast Flash White</b> | PCIe 3.0 x4.  |
|                  |  | <b>Fast Flash Red</b>   | Not appear as above.  |
| <b>Fault LED</b> |  | <b>OFF</b>              | The R7528D is powered off or not in error.  |
|                  |  | <b>Fast Flash Red</b>   | The LED blinks red at 4 Hz to indicate that any of the following have been triggered. <ul style="list-style-type: none"> <li>● The Broadcom chipset temperature is <math>&gt; 105^{\circ}\text{C}</math>.</li> <li>● The SSD temperature is <math>\geq</math> the SSD warning threshold.</li> </ul> |
|                  |   | <b>Slow Flash Red</b>   | The LED blinks red at 1 Hz to indicate that the initialized RAID is not in normal status.   |
|                  |   | <b>Solid Red</b>        | Both “ <b>Fast Flash Red</b> ” and “ <b>Slow Flash Red</b> ” above occur at the same time.  |

## 2.2. PCIe Host Interface

The R7528D’s PCIe 4.0 host interface provides maximum transmission. Other PCIe host interface features include the following:

- 16-lane PCIe host interface
- Support of x16 link width
- 16-lane aggregate bandwidth of up to 32GB/s

## 2.3. Storage Interface

The R7528D has four SFF-8654 interfaces. Other storage interface features include the following:

- Dedicated PCIe 4.0 x4 per port
- Supports up to eight NVMe devices (up to x4 lanes, U.2/U.3 media)
- Data transfer at 8GB/s

## 2.4. Basic Specifications

The following table describes the basic specifications of the R7528D.

**Table 4: Basic Specifications of R7528D**

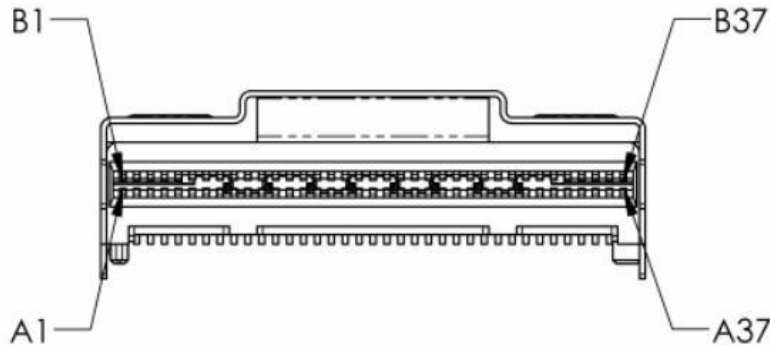
|  |               |                           |
|--|---------------|---------------------------|
| <b>Model</b>                           |               | <b>R7528D</b>             |
| <b>Form Factor</b>                     |               | LP-MD2, Single Width      |
| <b>Weight</b>                          |               | 340g                      |
| <b>Dimension</b>                       | <b>Length</b> | 6.10"                     |
|  | <b>Height</b> | 2.71"                     |
| <b>Power consumption</b>               |               | 29.58W                    |
| <b>Power supply</b>                    |               | PCIe: 12V, 3.3V           |
| <b>Work temperature</b>                |               | +5°C ~ +55°C              |
| <b>Storage temperature</b>             |               | -20°C ~ +80°C             |
| <b>MTBF (Mean Time Before Failure)</b> |               | > 5,000,000 hours at 40°C |

## 3. R7528D SFF-8654 Connector

### 3.1. SFF-8654 Connector Pin Designation

The R7528D has four x8 SFF-8654 connectors, designated as A and B. It follows the SFF-9402 standard for connector sideband signal assignments.

The following figure shows the SFF-8654 connector pin designation.



### 3.2. SFF-8654 Connector Pinout

The following table defines the R7528D's SFF-8654 connector pinouts.

**Table 5: SFF-8654 Connector Pinouts**

| Pin | Name           | Pin | Name      |
|-----|----------------|-----|-----------|
| A1  | GND            | B1  | GND       |
| A2  | PERp0          | B2  | PETp0     |
| A3  | PERn0          | B3  | PETn0     |
| A4  | GND            | B4  | GND       |
| A5  | PERp1          | B5  | PETp1     |
| A6  | PERn1          | B6  | PETn1     |
| A7  | GND            | B7  | GND       |
| A8  | NC             | B8  | U0_SCL    |
| A9  | NC             | B9  | U0_SDA    |
| A10 | GND            | B10 | GND       |
| A11 | SFF8654_LCK1_P | B11 | PE_RESET# |
| A12 | SFF8654_LCK1_N | B12 | U0_CWAKE# |

|     |                |     |           |
|-----|----------------|-----|-----------|
| A13 | GND            | B13 | GND       |
| A14 | PERp2          | B14 | PETp2     |
| A15 | PERn2          | B15 | PETn2     |
| A16 | GND            | B16 | GND       |
| A17 | PERp3          | B17 | PETp3     |
| A18 | PERn3          | B18 | PETn3     |
| A19 | GND            | B19 | GND       |
| A20 | PERp4          | B20 | PETp4     |
| A21 | PERn4          | B21 | PETn4     |
| A22 | GND            | B22 | GND       |
| A23 | PERp5          | B23 | PETp5     |
| A24 | PERn5          | B24 | PETn5     |
| A25 | GND            | B25 | GND       |
| A26 | NC             | B26 | U1_SCL    |
| A27 | NC             | B27 | U1_SDA    |
| A28 | GND            | B28 | GND       |
| A29 | SFF8654_LCK2_P | B29 | PE_RESET# |
| A30 | SFF8654_LCK2_N | B30 | U1_CWAKE# |
| A31 | GND            | B31 | GND       |
| A32 | PERp6          | B32 | PETp6     |
| A33 | PERn6          | B33 | PETn6     |
| A34 | GND            | B34 | GND       |
| A35 | PERp7          | B35 | PETp7     |
| A36 | PERn7          | B36 | PETn7     |
| A37 | GND            | B37 | GND       |

### 3.3. Backplane Connector Support

The R7528D supports the industry-standard SFF-TA-1005 Specification for Universal Backplane Management (UBM). UBM provides the following key features:

- Reports the backplane capabilities, including the following:
  - NVMe drive widths
  - Maximum speeds
  - Dual-port support
  - Support for drive power enable and disable (PWDIS)
- Supports cable order independence
  - Disk LED control and slot ID are not dependent on cable order
- Enables disk hot-plug insertion

#### 3.3.1. UBM Backplane

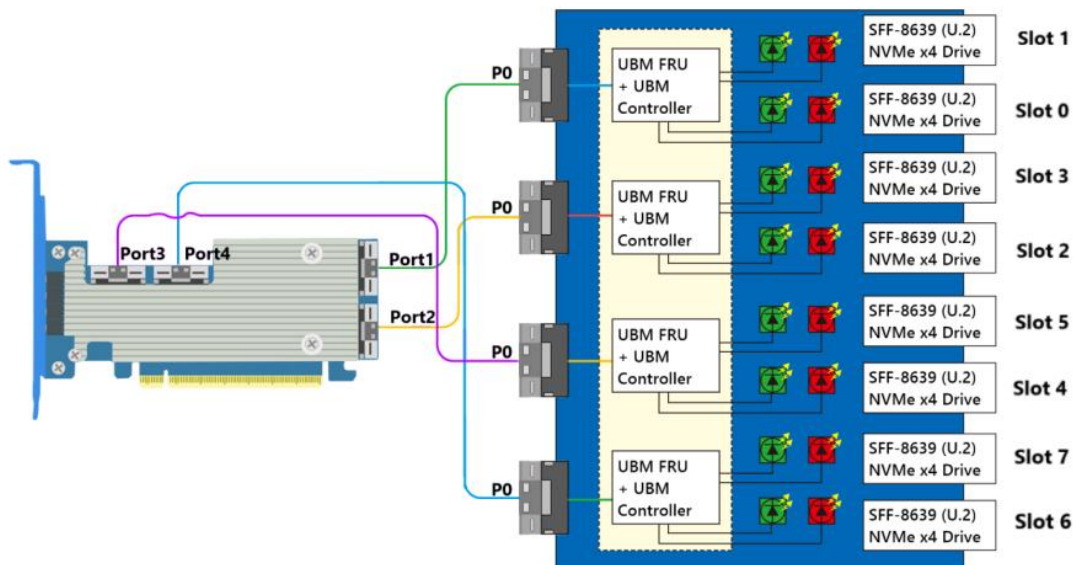
The SFF-TA-1005 (UBM) standard-compliant backplanes are designed to transmit slot numbers to the R7528D automatically. This innovation eliminates the need to manually configure cables between the R7528D and the backplane connector, optimizing cable flexibility.

##### 3.3.1.1. UBM Backplane with x8 Connectors

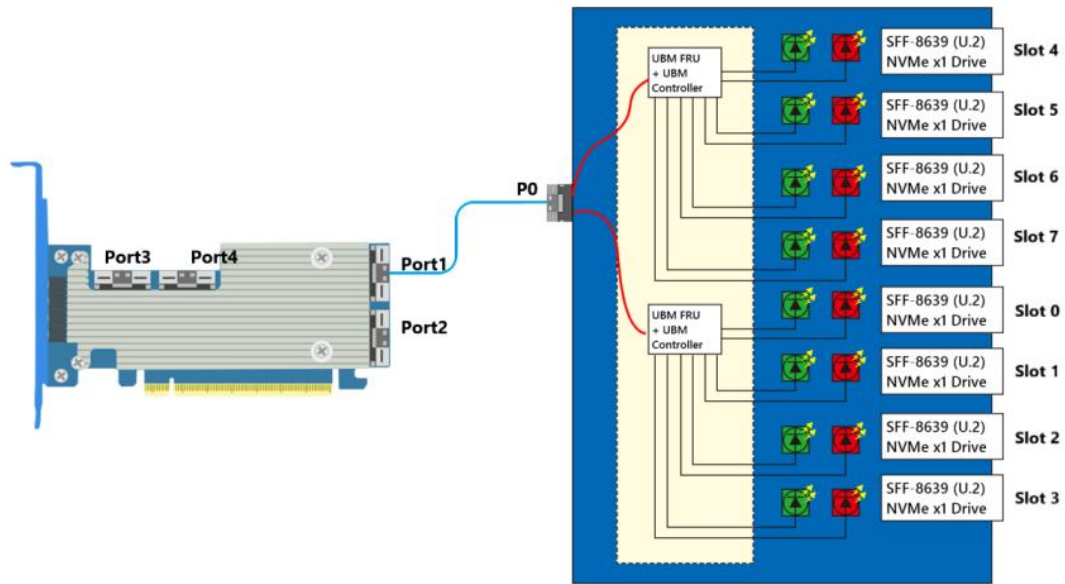
The following figures show a backplane using x8 connectors with one UBM target per connector. The red lines indicate the I<sub>2</sub>C bus connections. For the backplane LEDs to function properly and the disks to be recognized properly, it is imperative that the backplane connects the I<sub>2</sub>C connection of the UBM target to the specific x8 SFF-8654 connector. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

**Note:** In order to recognize the disk correctly, please connect all the required cables before use. Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

**Figure 1 UBM Backplane with x8 Connectors (8 Disks)**



**Figure 2 UBM Backplane with x8 Connectors (32 Disks)**



Note: For the connection of Port2, 3, and 4, please refer to Port1.

### 3.3.1.2. UBM Backplane with x4 Connectors

The following figures show a backplane using x4 connectors with one UBM target per connector. The red lines indicate the I<sub>2</sub>C bus connections. Or the backplane LEDs to function properly and the disks to be recognized properly, it is imperative that the backplane connects the I<sub>2</sub>C connection of the UBM target to the specific x4 SFF-8654 connector. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

Note: In order to recognize the disk correctly, please connect all the required cables before use. Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

Figure 3 UBM Backplane with x4 Connectors (8 Disks)

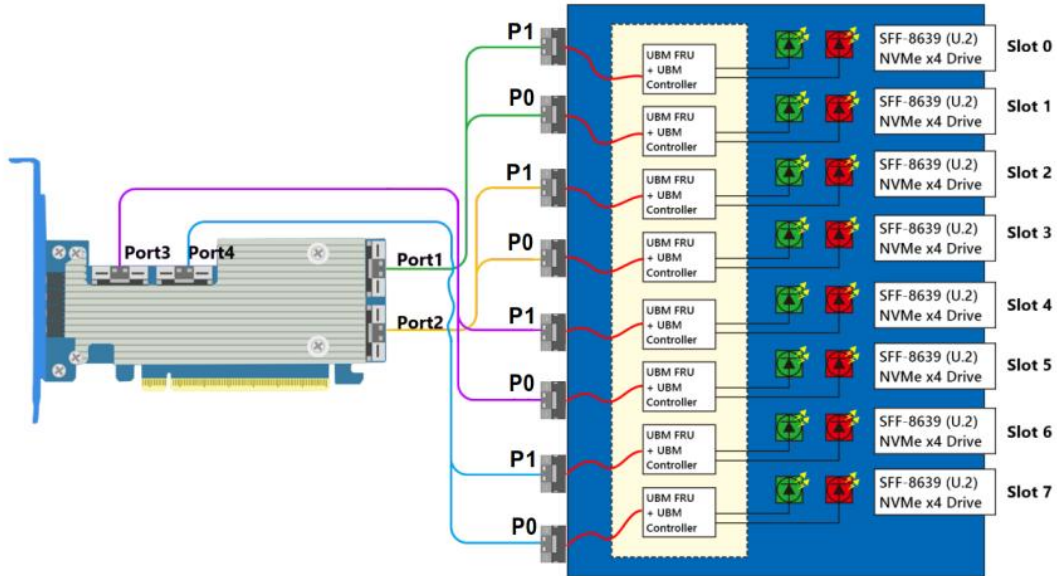
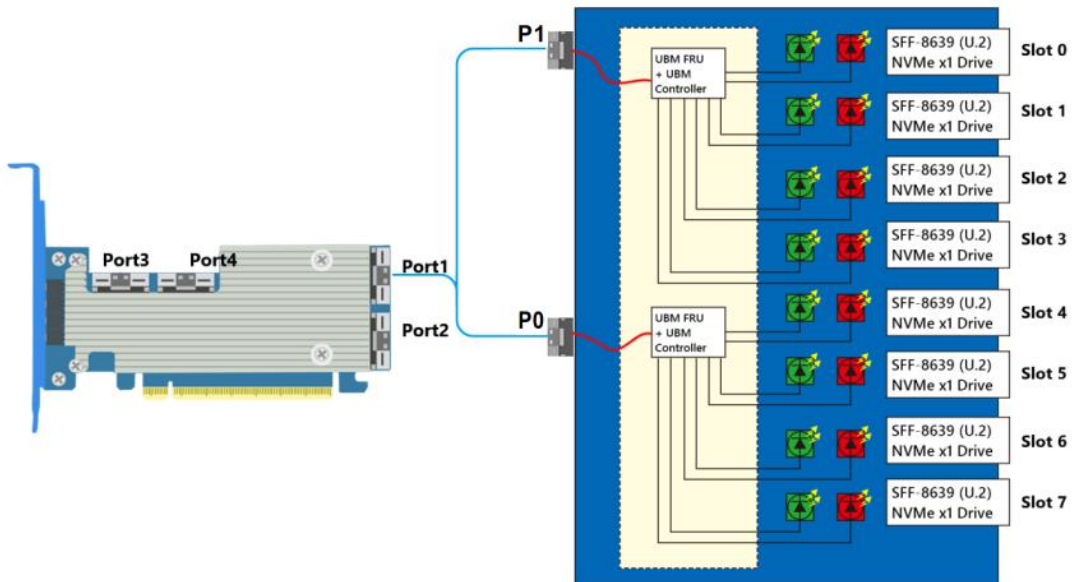


Figure 4 UBM Backplane with x4 Connectors (32 Disks)



Note: For the connection of Port2, 3, and 4, please refer to Port1.

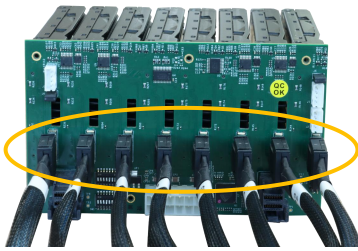
### 3.3.1.3. UBM Backplane Connection (8 Disks)

The following steps show the connection of the UBM backplane to the R7528D.

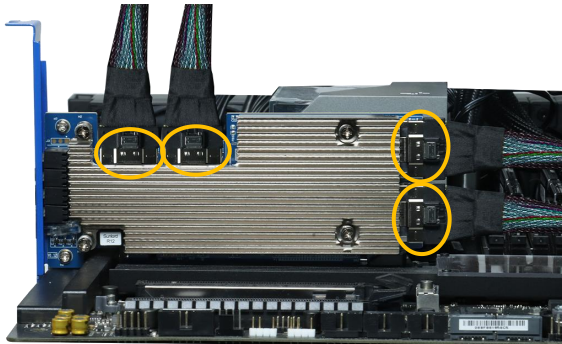
1. Connect the disks to the backplane.



2. Connect the cable connector to the backplane.



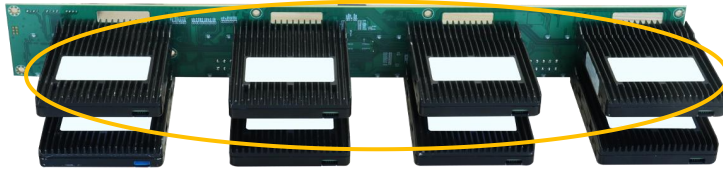
3. Connect the SFF-8654 connector to the R7528D.



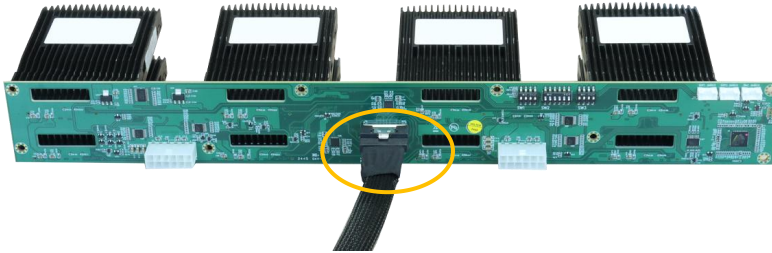
### 3.3.1.4. UBM Backplane Connection (32 Disks)

The following steps show the connection of the UBM backplane to the R7528D.

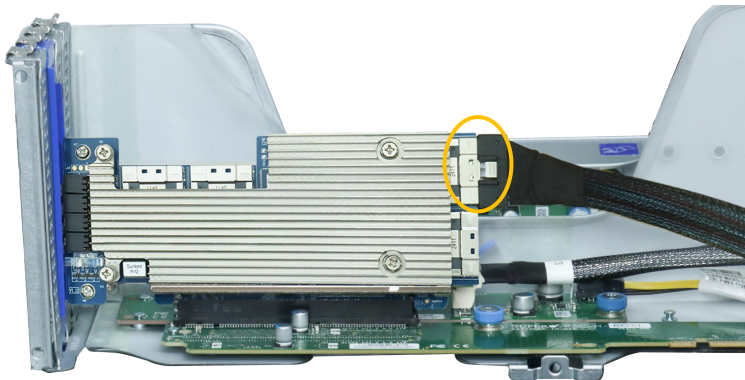
1. Connect the disks to the backplane.



2. Connect the cable connector to the backplane.



3. Connect the SFF-8654 connector to the R7528D.



### 3.3.2. VPP Backplane

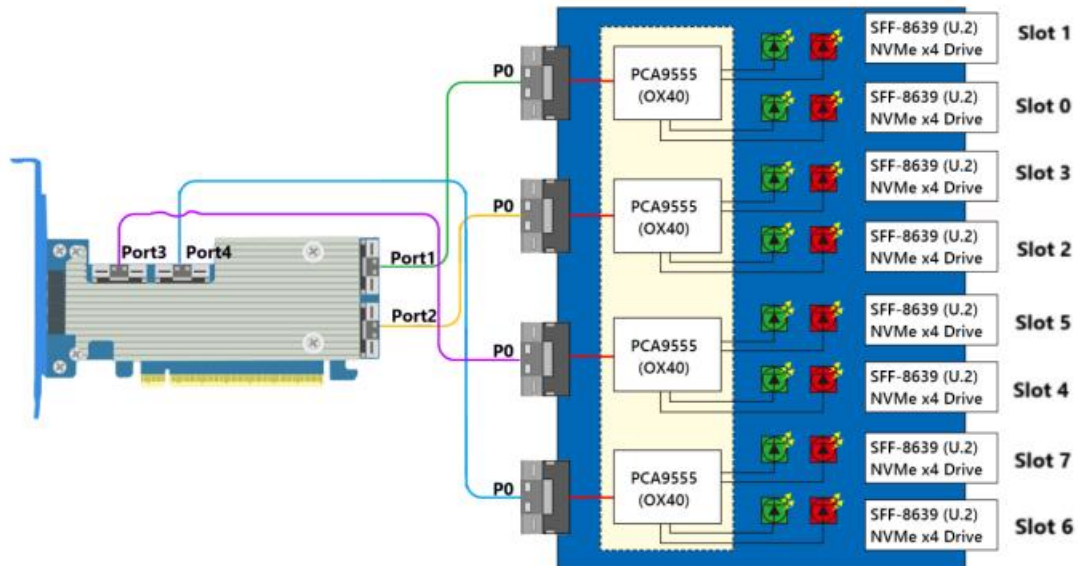
The R7528D supports the legacy implementation of Virtual Pin Port (VPP) backplane management. The cables must be connected according to the desired slot enumeration to identify the slots correctly. Connect the SFF-8654 connector of the R7528D to the backplane via the cable.

#### 3.3.2.1. Backplane with x8 Connectors and VPP

The figures below illustrate the anticipated connections to a backplane, utilizing x8 SFF-8654 connectors from the AIC to NVMe disks, with VPP over I<sub>2</sub>C employed for managing the backplane. The red line highlights the I<sub>2</sub>C bus connection. Or the backplane LEDs to function properly and the disks to be recognized properly, it is imperative that the backplane connects the I<sub>2</sub>C connection of the VPP target to the specific x8 SFF-8654 connector. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

**Note:** In order to recognize the disk correctly, please connect all the required cables before use. Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

**Figure 5 Backplane with x8 Connectors and VPP (8 Disks)**

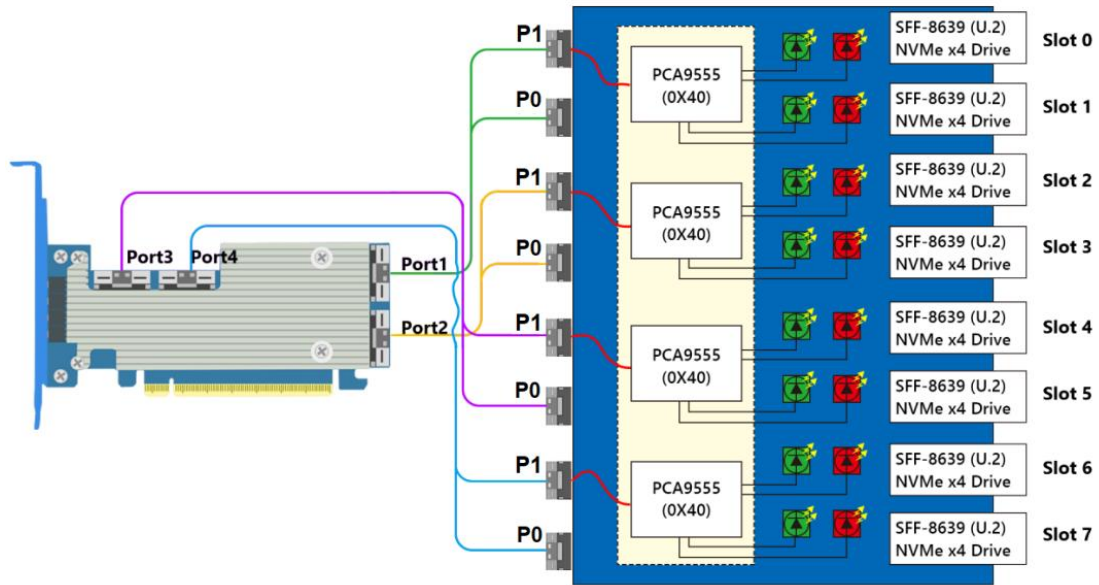


### 3.3.2.2. Backplane with x4 Connectors and VPP

The figure below illustrates the anticipated connections to a backplane, utilizing x4 SFF-8654 connectors from the AIC to NVMe disks, with VPP over I<sub>2</sub>C employed for managing the backplane. The red line highlights the I<sub>2</sub>C bus connection, or the backplane LEDs to function properly and the disks to be recognized properly, when using HighPoint supplied cables, connect the P0 labeled leg of the cable to the PCA9555 target. To ascertain which host-facing connector corresponds to a specific slot, please refer to the backplane's documentation.

Note: In order to recognize the disk correctly, please connect all the required cables before use. Prioritize the power supply to the backplane and disks, then to the host, or supply power simultaneously.

**Figure 6 Backplane with x4 Connectors and VPP (8 Disks)**



## 4. Cable Accessories

A wide selection of flexible cabling options is available for the R7528D, which enable the R7528D to mix configurations of U.2/U.3 NVMe SSDs via SFF-8639, SFF-8643, SFF-8654, SFF-8611, and MCIO connectors.

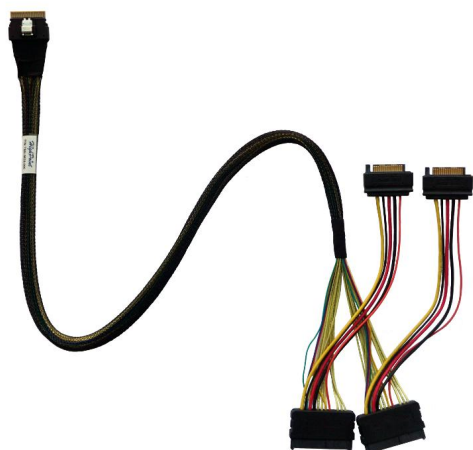
The following sections indicate the cable pinout and connection diagram for supported cable accessories.

### 4.1. TS8i-8639-060

SFF-8654 Host to U.2 SFF-8639 Device cable with a 15-pin SATA power connector. Each cable supports two U.2 NVMe SSDs. Length 0.6M.

#### 4.1.1. Cable Diagram

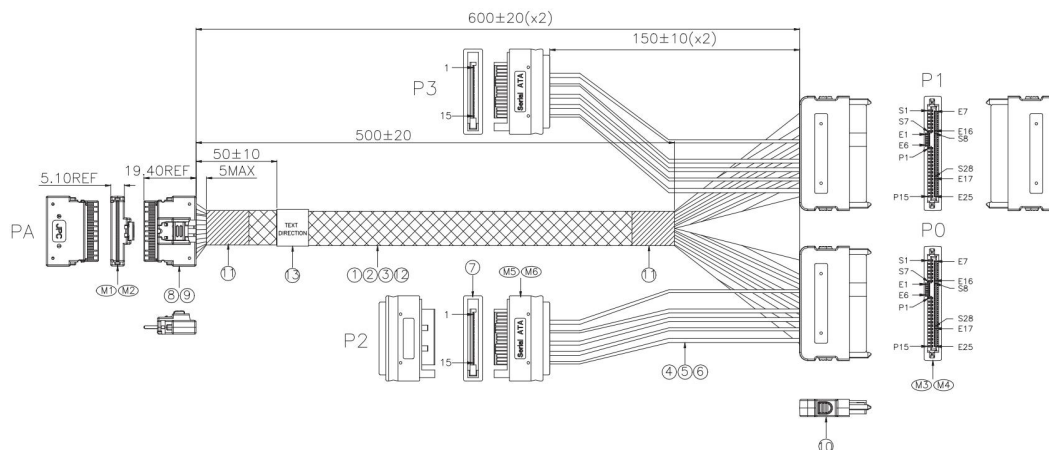
SFF-8654



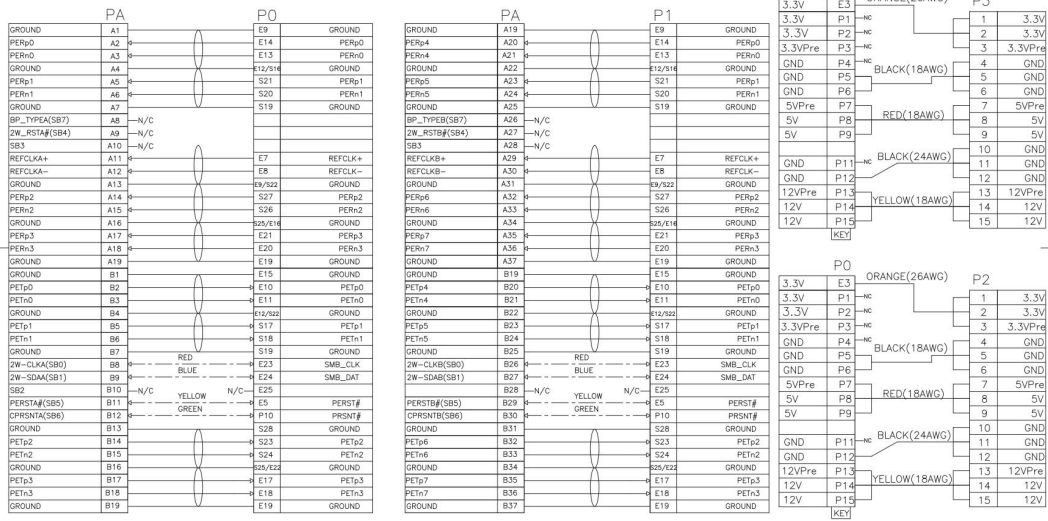
SFF-8639

#### 4.1.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint TS8i-8639-060 cable, one x8 SFF-8654 to two x4 SFF-8639 connection.



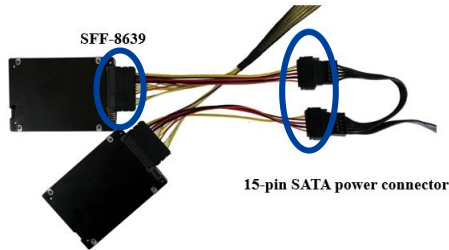
WIRING TABLE



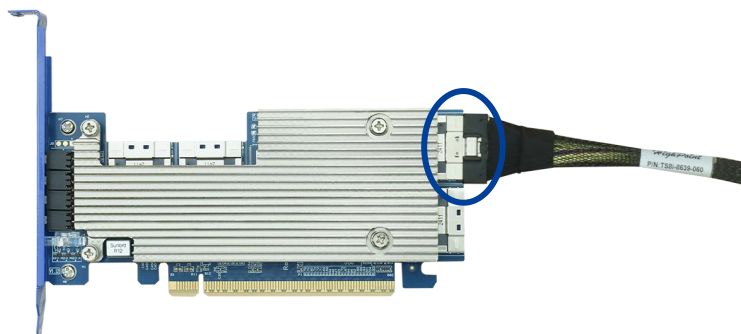
### 4.1.3. Cable Connection

The following steps show the connection of a U.2 SSD to the R7528D using the TS8i-8639-060 cable.

1. Connect the SFF-8639 connector of the TS8i-8639-060 cable to the NVMe SSD, and connect the 15-pin SATA power connector of the TS8i-8639-060 cable to the system power supply.



2. Connect the SFF-8654 connector of the TS8i-8639-060 cable to the R7528D.



## 4.2. 8654-8654-110

SFF-8654 Host to SFF-8654 Device cable. Each cable can host up to two NVMe SSDs. Length 1M.

### 4.2.1. Cable Diagram

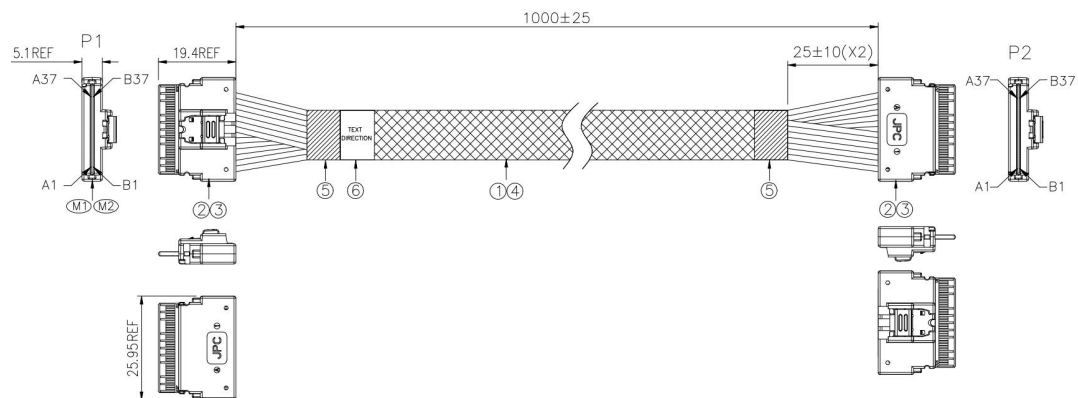


SFF-8654

SFF-8654

### 4.2.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint 8654-8654-110 cable, one x8 SFF-8654 to one x8 SFF-8654 connection.



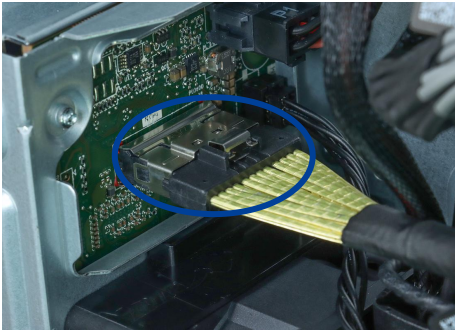
WIRING TABLE

| P1       |     | P2  |     | P1  |          | P2  |          |
|----------|-----|-----|-----|-----|----------|-----|----------|
| GROUND   | B37 | B37 | A37 | A37 | GROUND   | B37 | GROUND   |
| TX7-     | B36 | B36 | A36 | A36 | RX7-     | B36 | TX7-     |
| TX7+     | B35 | B35 | A35 | A35 | RX7+     | B35 | TX7+     |
| GROUND   | B34 | B34 | A34 | A34 | GROUND   | B34 | GROUND   |
| TX6-     | B33 | B33 | A33 | A33 | RX6-     | B33 | TX6-     |
| TX6+     | B32 | B32 | A32 | A32 | RX6+     | B32 | TX6+     |
| GROUND   | B31 | B31 | A31 | A31 | GROUND   | B31 | GROUND   |
| SIDEBAND | B30 | B30 | A30 | A30 | SIDEBAND | B30 | SIDEBAND |
| SIDEBAND | B29 | B29 | A29 | A29 | SIDEBAND | B29 | SIDEBAND |
| GROUND   | B28 | B28 | A28 | A28 | GROUND   | B28 | GROUND   |
| SIDEBAND | B27 | B27 | A27 | A27 | SIDEBAND | B27 | SIDEBAND |
| SIDEBAND | B26 | B26 | A26 | A26 | SIDEBAND | B26 | SIDEBAND |
| GROUND   | B25 | B25 | A25 | A25 | GROUND   | B25 | GROUND   |
| TX5-     | B24 | B24 | A24 | A24 | RX5-     | B24 | TX5-     |
| TX5+     | B23 | B23 | A23 | A23 | RX5+     | B23 | TX5+     |
| GROUND   | B22 | B22 | A22 | A22 | GROUND   | B22 | GROUND   |
| TX4-     | B21 | B21 | A21 | A21 | RX4-     | B21 | TX4-     |
| TX4+     | B20 | B20 | A20 | A20 | RX4+     | B20 | TX4+     |
| GROUND   | B19 | B19 | A19 | A19 | GROUND   | B19 | GROUND   |
| TX3-     | B18 | B18 | A18 | A18 | RX3-     | B18 | TX3-     |
| TX3+     | B17 | B17 | A17 | A17 | RX3+     | B17 | TX3+     |
| GROUND   | B16 | B16 | A16 | A16 | GROUND   | B16 | GROUND   |
| TX2-     | B15 | B15 | A15 | A15 | RX2-     | B15 | TX2-     |
| TX2+     | B14 | B14 | A14 | A14 | RX2+     | B14 | TX2+     |
| GROUND   | B13 | B13 | A13 | A13 | GROUND   | B13 | GROUND   |
| SIDEBAND | B12 | B12 | A12 | A12 | SIDEBAND | B12 | SIDEBAND |
| SIDEBAND | B11 | B11 | A11 | A11 | SIDEBAND | B11 | SIDEBAND |
| GROUND   | B10 | B10 | A10 | A10 | GROUND   | B10 | GROUND   |
| SIDEBAND | B9  | B9  | A9  | A9  | SIDEBAND | B9  | SIDEBAND |
| SIDEBAND | B8  | B8  | A8  | A8  | SIDEBAND | B8  | SIDEBAND |
| GROUND   | B7  | B7  | A7  | A7  | GROUND   | B7  | GROUND   |
| TX1-     | B6  | B6  | A6  | A6  | RX1-     | B6  | TX1-     |
| TX1+     | B5  | B5  | A5  | A5  | RX1+     | B5  | TX1+     |
| GROUND   | B4  | B4  | A4  | A4  | GROUND   | B4  | GROUND   |
| TX0-     | B3  | B3  | A3  | A3  | RX0-     | B3  | TX0-     |
| TX0+     | B2  | B2  | A2  | A2  | RX0+     | B2  | TX0+     |
| GROUND   | B1  | B1  | A1  | A1  | GROUND   | B1  | GROUND   |

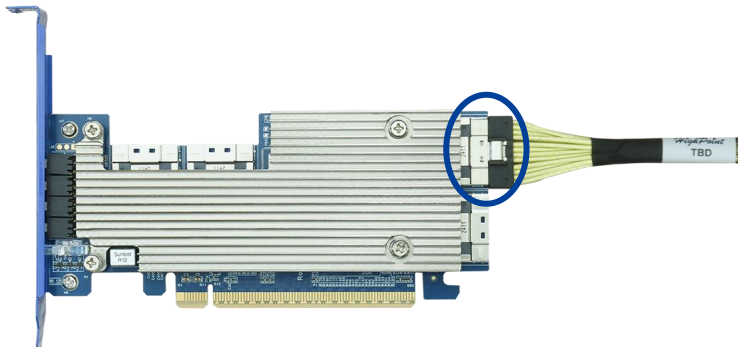
### 4.2.3. Cable Connection

The following steps show the connection of the backplane to the R7528D using the 8654-8654-110 cable.

1. Connect the SFF-8654 connector of the 8654-8654-110 cable to the backplane.



2. Connect the other SFF-8654 connector of the 8654-8654-110 cable to the R7528D.



### 4.3. 8654-CIO8-110

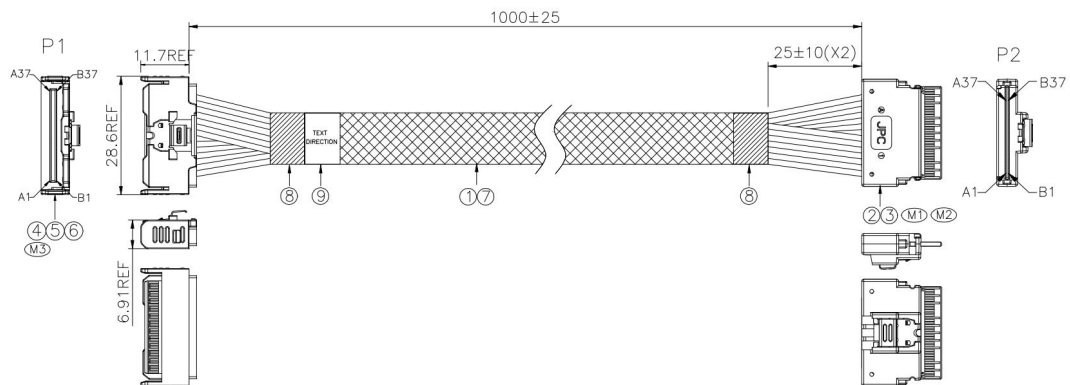
SFF-8654 Host to MCIO Device cable. Each cable can host up to two NVMe SSDs. Length 1M.

#### 4.3.1. Cable Diagram



#### 4.3.2. Cable Drawings and Pinouts

The following figure shows the pinout for the HighPoint 8654-CIO8-110 cable, one x8 SFF-8654 to one x8 MCIO connection.



WIRING TABLE

| P1       |     |     | P2  |     |          | P1       |     |     | P2  |     |          |
|----------|-----|-----|-----|-----|----------|----------|-----|-----|-----|-----|----------|
| GROUND   | B37 | B37 | A37 | A37 | GROUND   | GROUND   | A37 | A37 | B37 | B37 | GROUND   |
| TX7-     | B36 | B36 | A36 | A36 | RX7-     | RX7-     | A36 | A36 | B36 | B36 | TX7-     |
| TX7+     | B35 | B35 | A35 | A35 | RX7+     | RX7+     | A35 | A35 | B35 | B35 | TX7+     |
| GROUND   | B34 | B34 | A34 | A34 | GROUND   | GROUND   | A34 | A34 | B34 | B34 | GROUND   |
| TX6-     | B33 | B33 | A33 | A33 | RX6-     | RX6-     | A33 | A33 | B33 | B33 | TX6-     |
| TX6+     | B32 | B32 | A32 | A32 | RX6+     | RX6+     | A32 | A32 | B32 | B32 | TX6+     |
| GROUND   | B31 | B31 | A31 | A31 | GROUND   | GROUND   | A31 | A31 | B31 | B31 | GROUND   |
| SIDEBAND | B30 | B30 | A30 | A30 | SIDEBAND | SIDEBAND | A30 | A30 | B30 | B30 | SIDEBAND |
| SIDEBAND | B29 | B29 | A29 | A29 | SIDEBAND | SIDEBAND | A29 | A29 | B29 | B29 | SIDEBAND |
| GROUND   | B28 | B28 | A28 | A28 | GROUND   | GROUND   | A28 | A28 | B28 | B28 | GROUND   |
| SIDEBAND | B27 | B27 | A27 | A27 | SIDEBAND | SIDEBAND | A27 | A27 | B27 | B27 | SIDEBAND |
| SIDEBAND | B26 | B26 | A26 | A26 | SIDEBAND | SIDEBAND | A26 | A26 | B26 | B26 | SIDEBAND |
| GROUND   | B25 | B25 | A25 | A25 | GROUND   | GROUND   | A25 | A25 | B25 | B25 | GROUND   |
| TX5-     | B24 | B24 | A24 | A24 | RX5-     | RX5-     | A24 | A24 | B24 | B24 | TX5-     |
| TX5+     | B23 | B23 | A23 | A23 | RX5+     | RX5+     | A23 | A23 | B23 | B23 | TX5+     |
| GROUND   | B22 | B22 | A22 | A22 | GROUND   | GROUND   | A22 | A22 | B22 | B22 | GROUND   |
| TX4-     | B21 | B21 | A21 | A21 | RX4-     | RX4-     | A21 | A21 | B21 | B21 | TX4-     |
| TX4+     | B20 | B20 | A20 | A20 | RX4+     | RX4+     | A20 | A20 | B20 | B20 | TX4+     |
| GROUND   | B19 | B19 | A19 | A19 | GROUND   | GROUND   | A19 | A19 | B19 | B19 | GROUND   |
| TX3-     | B18 | B18 | A18 | A18 | RX3-     | RX3-     | A18 | A18 | B18 | B18 | TX3-     |
| TX3+     | B17 | B17 | A17 | A17 | RX3+     | RX3+     | A17 | A17 | B17 | B17 | TX3+     |
| GROUND   | B16 | B16 | A16 | A16 | GROUND   | GROUND   | A16 | A16 | B16 | B16 | GROUND   |
| TX2-     | B15 | B15 | A15 | A15 | RX2-     | RX2-     | A15 | A15 | B15 | B15 | TX2-     |
| TX2+     | B14 | B14 | A14 | A14 | RX2+     | RX2+     | A14 | A14 | B14 | B14 | TX2+     |
| GROUND   | B13 | B13 | A13 | A13 | GROUND   | GROUND   | A13 | A13 | B13 | B13 | GROUND   |
| SIDEBAND | B12 | B12 | A12 | A12 | SIDEBAND | SIDEBAND | A12 | A12 | B12 | B12 | SIDEBAND |
| SIDEBAND | B11 | B11 | A11 | A11 | SIDEBAND | SIDEBAND | A11 | A11 | B11 | B11 | SIDEBAND |
| GROUND   | B10 | B10 | A10 | A10 | GROUND   | GROUND   | A10 | A10 | B10 | B10 | GROUND   |
| SIDEBAND | B9  | B9  | A9  | A9  | SIDEBAND | SIDEBAND | A9  | A9  | B9  | B9  | SIDEBAND |
| SIDEBAND | B8  | B8  | A8  | A8  | SIDEBAND | SIDEBAND | A8  | A8  | B8  | B8  | SIDEBAND |
| GROUND   | B7  | B7  | A7  | A7  | GROUND   | GROUND   | A7  | A7  | B7  | B7  | GROUND   |
| TX1-     | B6  | B6  | A6  | A6  | RX1-     | RX1-     | A6  | A6  | B6  | B6  | TX1-     |
| TX1+     | B5  | B5  | A5  | A5  | RX1+     | RX1+     | A5  | A5  | B5  | B5  | TX1+     |
| GROUND   | B4  | B4  | A4  | A4  | GROUND   | GROUND   | A4  | A4  | B4  | B4  | GROUND   |
| TX0-     | B3  | B3  | A3  | A3  | RX0-     | RX0-     | A3  | A3  | B3  | B3  | TX0-     |
| TX0+     | B2  | B2  | A2  | A2  | RX0+     | RX0+     | A2  | A2  | B2  | B2  | TX0+     |
| GROUND   | B1  | B1  | A1  | A1  | GROUND   | GROUND   | A1  | A1  | B1  | B1  | GROUND   |

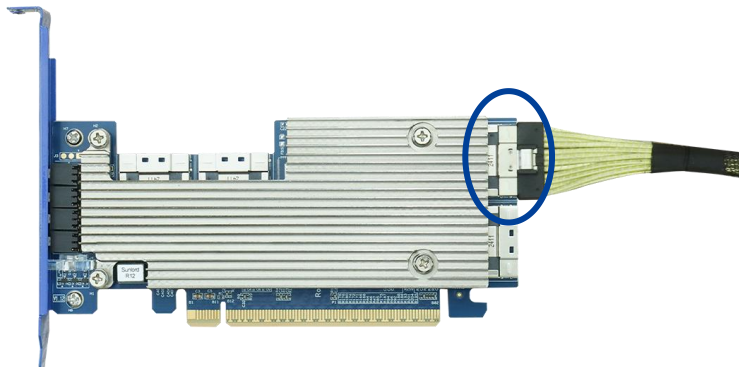
### 4.3.3. Cable Connection

The following steps show the connection of an NVMe SSD to the R7528D using the 8654-CIO8-110 cable.

1. Connect the MCIO connector of the 8654-CIO8-110 cable to the backplane.



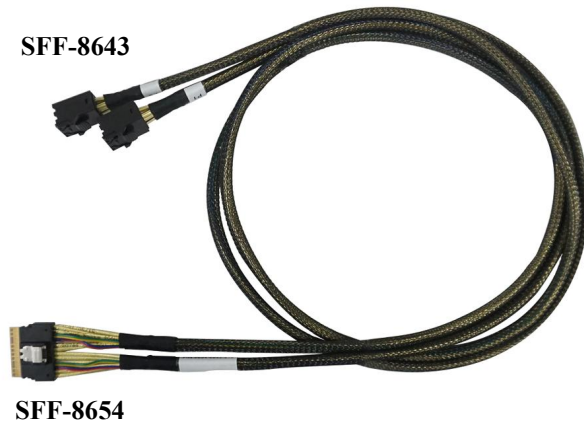
2. Connect the SFF-8654 connector of the 8654-CIO8-110 cable to the R7528D.



## 4.4. 8654-8643-210

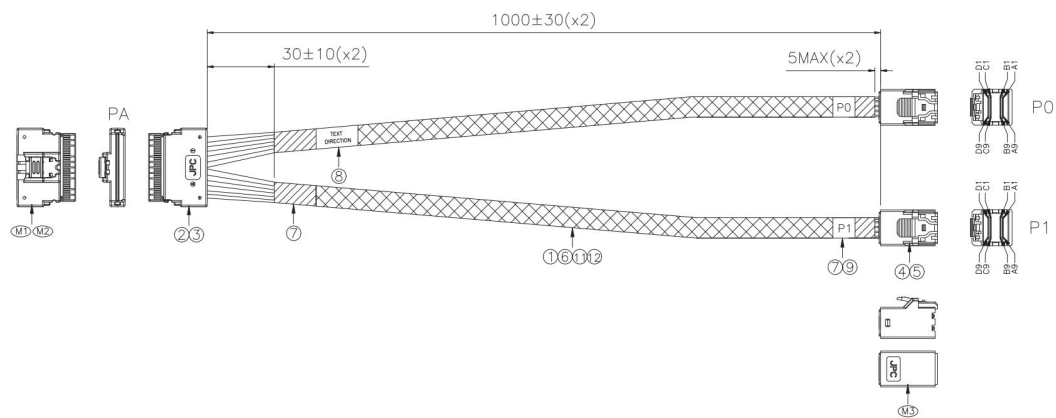
SFF-8654 Host to SFF-8643 Device cable. Each cable can host up to two NVMe SSDs. Length: 1M.

### 4.4.1. Cable Diagram

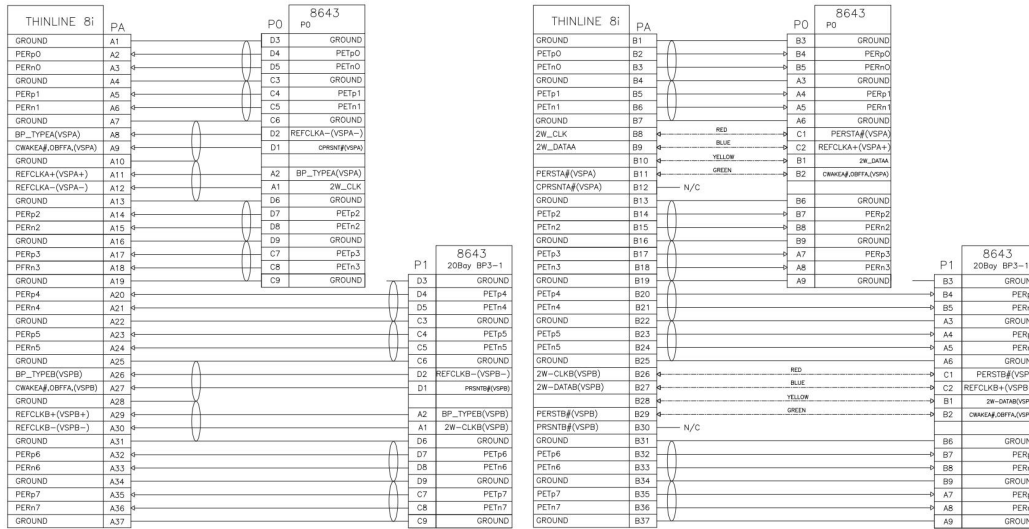


### 4.4.2. Cable Drawings and Pinouts

The following figure shows the HighPoint 8654-8643-210 cable pinout, one x8 SFF-8654 to two x4 SFF-8643 connection.



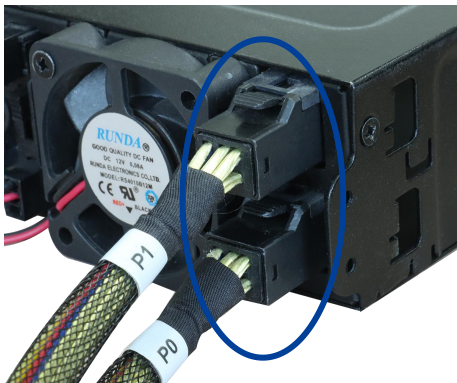
WIRING TABLE



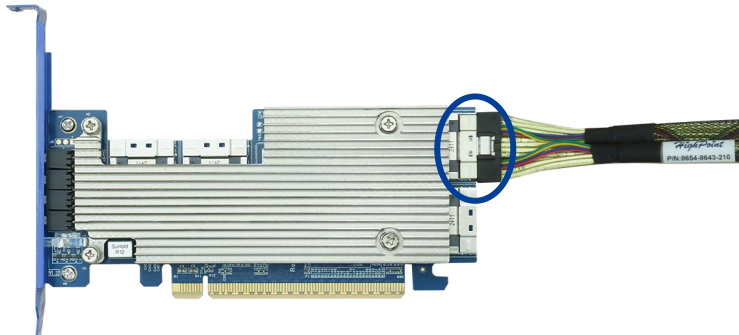
### 4.4.3. Cable Connection

The following steps show the connection of the SSD enclosure to the R7528D using the 8654-8643-210 cable.

4. Connect the SFF-8643 connector of the 8654-8643-210 cable to the SSD enclosure.



5. Connect the SFF-8654 connector of the 8654-8643-210 cable to the R7528D.



## 4.5. 8654-8611-205

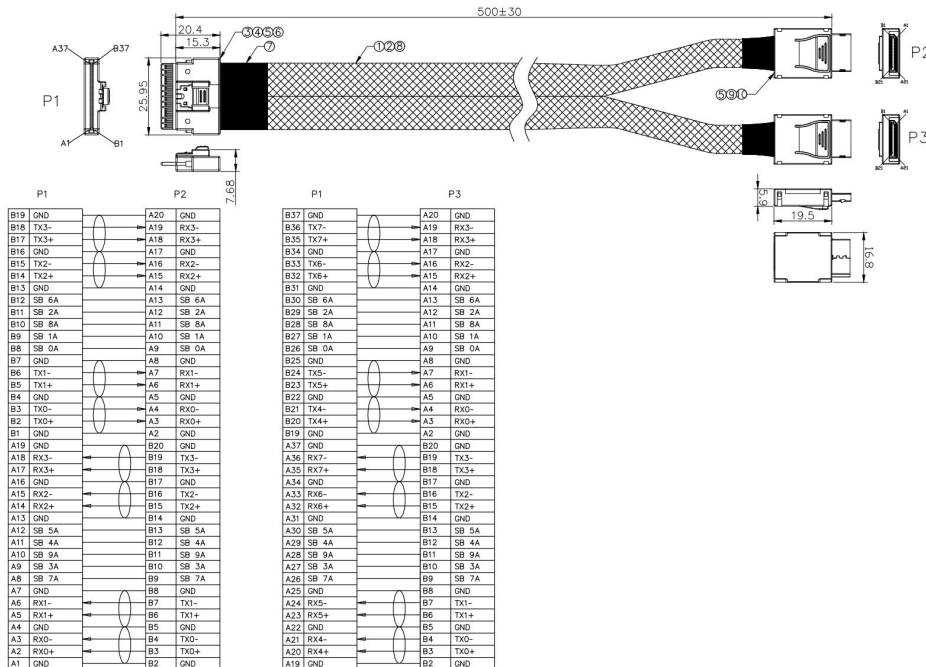
SFF-8654 Host to SFF-8611 Device cable. Each cable can host up to two NVMe SSDs. Length: 0.5M.

### 4.5.1. Cable Diagram



### 4.5.2. Cable Drawings and Pinouts

The following figure shows the HighPoint 8654-8611-205 cable pinout, one x8 SFF-8654 to two x4 SFF-8611 connection.



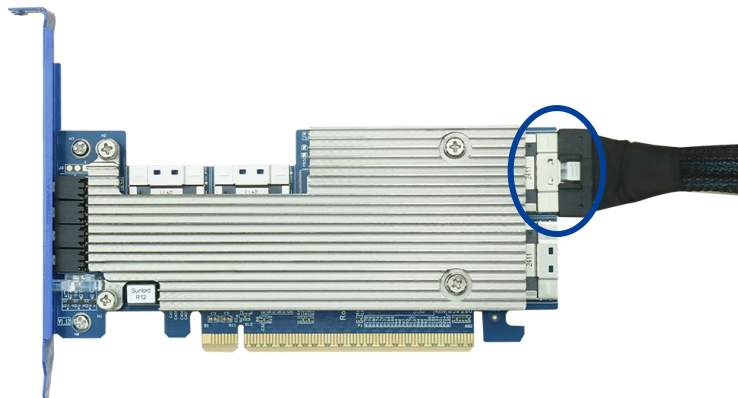
### 4.5.3. Cable Connection

The following steps show the connection of the SSD enclosure to the R7528D using the 8654-8611-205 cable.

1. Connect the SFF-8611 connector of the 8654-8611-205 cable to the SSD enclosure.



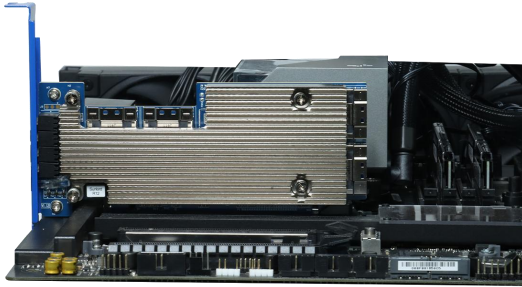
2. Connect the SFF-8654 connector of the 8654-8611-205 cable to the R7528D.



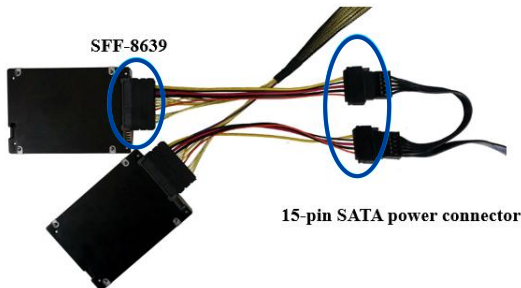
## 5. R7528D Installation Instructions

The R7528D provides four SFF-8654 connectors. These connectors accept a variety of HighPoint Certified Cable Accessories (see the Accessories section towards the end of this guide for more information). The following steps explain how to connect U.2 NVMe SSDs directly to the R7528D using the HighPoint TS8i-8639-060 cable.

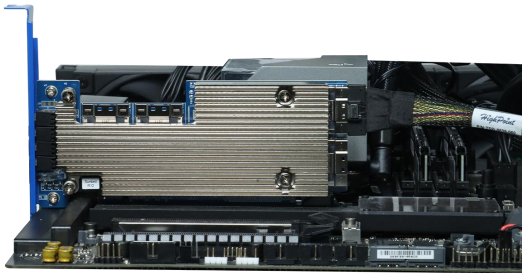
1. Use a wired ESD wrist strap that is properly grounded.
2. Unpack and remove the R7528D and check it for damage. If it appears damaged, please get in touch with HighPoint Technical Support.
3. Shut down the system and disconnect the AC power cord.
4. Align the R7528D to one of the motherboard's available slots. Press down gently but firmly to seat the R7528D correctly in the slot.



5. Connect the SFF-8639 connector of the TS8i-8639-060 cable to the NVMe SSD, and connect the 15-pin SATA power connector to the power supply



6. Connect the SFF-8654 connector of the TS8i-8639-060 cable to the R7528D.



7. Connect the remaining NVMe SSDs to the R7528D as described above.
8. Turn on the power to the system.

## 6. Revision History

### 6.1. Version 1.00, June 18, 2024

Initial version.

### 6.2. Version 1.01, February 5, 2025

1. Add [UBM Backplane with x8 Connectors](#)
2. Add [UBM Backplane with x4 Connectors](#)
3. Add [UBM Backplane Connection \(8 Disks\)](#)
4. Add [UBM Backplane Connection \(32 Disks\)](#)
5. Add [Backplane with x8 Connectors and VPP](#)
6. Add [Backplane with x4 Connectors and VPP](#)
7. Update SSD LED flashing frequency change

### 6.3. Version 1.02, March 17, 2025

Adjusting the UBM/ VPP cable connection order.

### 6.4. Version 1.03, June 23, 2025

Adjust the description format of the [Status LED](#) (be more concise).