areca® At the Heart of Storage

# ARC-1686-2NOD/4NOD/6NOD

## (Entry Level M.2 NVMe Hardware RAID Adapters)

The ARC-1686 series presents the advanced hardware RAID technology in enhanced performance of using 2/4/6 Bays M.2 NVMe. The hardware RAID adapter support off module power loss protection (PLP), on-board hold up supercapacitor, and M.2 slot Power Disable feature for guaranteed data protection. This is designed in a 1.6 GHz dual-core ROC processor and PCIe Gen 4.0 host/device interface and supports RAID levels 0, 1 (Simple/Multi Mirroring), 10, Single Disk (Single/Dual/Triple) or JBOD.

## Highlights

- Supports 2/4/6 Bays M.2
- Tri-mode interface at each M.2 bays - 12Gb/s SAS/SATA / Gen 4.0 PCIe (NVMe)
- x8 PCIe Gen 4.0 host interface
- Support individual NVMe Power Disable feature
- Support off module power loss protection for Non PLP NVMe drive using on-board supercapacitor
- RAID levels 0, 1 (Simple/Multi Mirroring), 10, Single Disk (Single/Dual/Triple) or JBOD
- SED support for hardware NVMe encryption capable drives
- Redundant flash image for adapter availability
- Hardware secure boot ready
- Capacity expansion, RAID level/stripe size migration
- Broad operating support including Windows, Linux (open source), FreeBSD (open source), Mac and VMware

## NVMe Performance Gains for Fast Data

Based on the Broadcom SAS3908/3916 x8 PCIe Gen 4.0 to SAS/SATA/PCIe RAID on Chip (ROC) controller, the ARC-1686 entry-level RAID adapter raises the standard to higher performance levels with several enhancements including a new high performance 1.6 GHz dual core ROC processor, outstanding performance PCIe Gen 4.0 host and 12Gb/s SAS/SATA/PCIe (NVMe) interface bus interconnection. The ARC-1686, providing an extremely fast, reliable, and ultra-compact solution for companies that need storages, is especially designed and featured in the high-speed data recording and processing. This RAID adapter can back up to 2/4/6 NVMe on just one PCIe adapter, increasing the capacity/speed as more NVMes are added to it. The ARC-1686 supports both 2280 and 22110 form factor NVMe drives and combines them on a tri-mode RAID adapter to maximize I/O performance for database applications and streaming digital media environments.

## Guaranteed Data Protection

In Areca's high-performance RAID solution, ARC-1686 brings PCIe NVMe to a superior performance hardware RAID at an elevated throughput, high IOPs and a low latency. It supports the hardware RAID levels 0, 1(Simple/Multi Mirroring), 10, Single Disk(Single/Dual/Triple) or JBOD. The ARC-1686 Power Disable feature provides an easy way to power cycle a physical NVMe drive in order to perform a hard reset. This can be useful if a NVMe drive locks up for some reason, and you don't want to send a technician to the physical RAID storage and manually "power down" and "power on" your system in order to power cycle the NVMe drive. Now, ARC-1686 can do this function automatically to check the drive is indeed failed or can be re-used. This saves customers time, money and lost compute time associated with transient drive failures and unnecessary drive returns. The ARC-1686 RAID adapter off module power loss protection (PLP) is optimized for datacenter environments. Its efficient PLP typically applies the capacitors on the NVMe SSD to provide hold-up power until the data is flushed from the NVMe internal DRAM to the NAND flash upon a sudden power off or any failure condition occurrence. ARC-1686 utilizes the on-board supercapacitor to provide off module hold-up power, eliminating the need for capacitors on the NVMe SSDs which helps reduce cost. The on-board supercapacitor also supplies the power to keep fault LED status and easily be identified as a failed drive when it is removed from the system PCIe slot.

## Maximum Interoperability

The ARC-1686 RAID adapter supports broad operating system including Windows, Linux (Open Source), FreeBSD (Open Source), Mac, VMware and more, along with key system monitoring features such as enclosure management and SNMP function. Our products and technology are based on extensive testing and validation processes, optimizing ARC-1886 series adapter in field-proven compatibility with operating systems, motherboards, applications, and device drivers.

## Intuitive RAID Management

The McBIOS RAID is a BIOS based utility used to simplify configurations and manage RAID adapter via hot keys at M/B BIOS boot-up screen. Without deploying an agent, you can also configure, deploy, update, and monitor the ARC-1686 via the GUI or through CLI utility. Customers can launch the firmware browser based McRAID GUI through ArcHttp proxy server. Additionally, Areca ArcSAP storage manager allows the user to scan multiple RAID units in the network and perform GUI management operations across multiple RAID units.

## Adapter Architecture

- Dual Core RAID-on-Chip (ROC) 1.6GHz processor
- PCIe Gen 4.0 x8 lane host interface
- Support both 2280 and 22110 form factor M.2 NVMe drives
- Support 2/4/6 bays M.2
- Tri-mode interface at each M.2 bay - 12Gb/s SAS/SATA / PCIe Gen 4.0 (NVMe)
- Multi-adapter support for large storage requirements
- Supports Power Disable feature for each NVMe drive
- BIOS boot array support for greater fault tolerance
- Device Interface per M.2 slot PCIe Gen 4.0 at 16GT/s per lane
- Boot support for the uEFI host BIOS
- NVRAM for RAID event & transaction log
- Redundant flash image for controller availability
- Support NVMe off module power loss protection using on-board supercapacitor

## Monitors/Notification

- System status indication through individual M2 fault LED and alarm buzzer
- SMTP support for email notification
- On-board supercapacitor to keep on M.2 fault LED status for troubleshooting
- SNMP support for remote manager
- Universal Bay Management (UBM) ready

## RAID Management

- Field-upgradeable firmware in flash ROM
- Hot key "boot-up" McBIOS RAID manager via M/B BIOS
- Web browser-based McRAID storage manager
- Support command-line interface (CLI)
- Single Admin Portal (ArcSAP) storage manager
- API library for developers to configure RAID adapters with their own utility

## RAID Features

- RAID levels 0, 1(Simple/Multi Mirroring), 10, Single Disk (Single/Dual/Triple) or JBOD
- Multiple RAID selections
- Array roaming
- RAID level/stripe size migration
- Capacity expansion and RAID level migration simultaneously
- Volume set growth
- Instant availability and background initialization
- Support global and dedicated hot spare
- S.M.A.R.T. support
- Support UNMAP command
- Multiple pairs SSD disk clone function
- SSD automatic monitor clone (AMC)
- SED support for hardware NVMe encryption capable drives
- Support individual NVMe Power Disable feature

## Operating System

- Windows 11/10 / Server 2022/2019/2016
- Linux / FreeBSD / XenServer / unRAID
- VMware (Driver 7.x/6.7 support CLI in-band management)
- macOS

For more information & latest supported OS listing visit **www.areca.com.tw**

## Environmental Specifications

| | |
|---|---|
| Operating Voltage | 12V |
| Temperature | Operating: 0˚c to 55˚c<br>Storage: -40˚c to 70˚c |
| Humidity | Operating: 10-85%, relative humidity<br>Non-operating: 5-90%, relative humidity |
| Compliance Certification | CE, FCC, RoHS |

| Model Name | | ARC-1686-2NOD | ARC-1686-4NOD | ARC-1686-6NOD |
|---|---|---|---|---|
| I/O Processor | | Tri-Mode Dual Core ARM A15 1.6GHz ROC | | |
| Host Interface | | PCIe 4.0 x8 Lanes | | |
| Form Factor | | 64.41(H) x 167.65(L) mm | 107.2(H) x 205(L) mm | 107.2(H) x 262(L) mm |
| Device Connector | | 2 x M.2 Connector | 4 x M.2 Connector | 6 x M.2 Connector |
| Max M.2 Devices Support | | 2 x NVMe[x4] | 4 x NVMe[x4] | 2 x NVMe[x4] + 4 x NVMe[x2] |
| RAID Level | | 0, 1, Single Disk(Single/Dual), JBOD | 0, 1(Simple/Multi Mirroring), 10, Single Disk(Single/Dual/Triple) or JBOD. | |
| Device Interface | | 6Gb/s SATA, Gen 4.0 PCIe (NVMe) | | |
| Management Port | | In-Band: PCIe | | |
| Power Loss Protection (PLP) Support | | Yes | | |
| Individual NVMe Power Disable Feature | | Yes | | |
| Hold-up Supercapacitor | | On-board | | |
| Software Package | | Same as ARC-1886 Tri-Mode RAID Adapter | | |
| Power Consumption | Each M.2 slot | Peak Current: 4.5A（3.3V）* Typical Current: 2.8A（3.3V） | | |
| | Controller | 10.2 Watts<br>Typical Current: 0.85A（12V） | 13.2 Watts<br>Typical Current: 1.1A（12V） | |
| Products View | |  |  |  |

* ***NOTE:*** Please check the M.2 vendor about the peak current of the device when operating.



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