

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 1 of 49

# COMBACK ARION 3U Library Installation Guide

COMBACK GmbH 06/02/2023

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 2 of 49	

## Content

1	Introduction .....	4
1.1	Document Purpose.....	4
2	General Warnings .....	6
2.1	Document Conventions: .....	6
2.2	General Product Warnings .....	6
3	Product Overview .....	10
3.1	Supported Library Configurations – Rackmount Installation.....	10
3.2	Supported Library Configurations – Tabletop Installation .....	13
3.3	Supported Module Configurations with Legacy Serial ADI Drive Sleds.....	13
3.4	Supported Tape Drives.....	13
3.5	Front Panel.....	14
3.6	Rear Panel .....	15
3.7	Power Supply Rear Panel LEDs.....	16
3.8	Element Numbering.....	17
4	Installing the Library .....	18
4.1	Planning Installation .....	18
4.2	Location Requirements.....	18
4.3	SAS Configuration Requirements.....	18
4.4	Fibre Channel Configuration Requirements .....	19
4.5	Planning Module and Rack Layout.....	20
4.6	Internal IP Range Selection.....	20
4.7	Host Preparation .....	21
4.8	Installation Precautions .....	22
4.9	Unpacking Base Module and Expansion Modules .....	23
4.10	Identifying Library Module Components .....	26
4.11	Preparing Top and Bottom Modules .....	27
4.12	Installing Modules in a Rack.....	32
4.13	Aligning and Connecting Modules .....	36
4.14	Installing Tape Drives .....	37
4.15	Connecting Fibre Channel Cables.....	38
4.16	Connecting SAS Cables .....	38
4.17	Powering On the Library.....	39
4.18	Using the Configuration Wizard.....	40
4.19	Verifying the Host Connection .....	40
4.20	Loading Tape Cartridges .....	40
4.20.1	Labeling Tape Cartridges.....	40
4.20.2	Using the Mailslot.....	40
4.20.3	Bulk Loading Magazines .....	42
4.21	Verifying the Installation .....	43
4.22	Configuring Additional Features .....	43
5	Tape Cartridges and Magazines .....	44
5.1	Tape Cartridges.....	44

	<b>COMBACK ARION 3U Library Installation Guide</b>	
COMBACK ARION	<b>3.0</b>	02/06/2023
		Page: 3 of 49

5.1.1 Using and Maintaining Tape Cartridges .....45

5.1.2 Labeling Tape Cartridges .....45

5.1.3 Write Protecting Tape Cartridges .....46

6 Initial Setup of the Library .....47

6.1 Using the OCP .....48

6.2 Using the RMI.....48

6.3 Using the Initial Configuration Wizard on the OCP .....48

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 4 of 49	

## 1 Introduction

### 1.1. Document Purpose

This document provides information to install, operate, upgrade, service and troubleshoot the COMBACK ARION Scalable Tape Library. The instructions are intended for the trained System Administrators and trained Users who need physical and functional knowledge of the COMBACK ARION library.



#### **WARNING**

- Only trained personnel should operate this equipment.
- Read all documentation and procedures before installation or operation.
- The COMBACK ARION must only be installed in a restricted Area.
- Only personnel with technical and product safety training should be provided access to the library.
- For safety reasons the default administrator PIN on the Operator Control Panel needs to be changed during initial configuration.
- Hazardous moving parts exist inside this product. Do not insert tools or any parts of your body into the interior of the library while the mailslot or magazine is pulled out.
- Do not insert any tools or any parts of your body into drive bay openings or any other openings of an operating system.



#### **AVERTISSEMENT**

Cet équipement ne doit être utilisé que par un personnel formé. Lisez la totalité de la documentation et des procédures avant toute installation ou utilisation. Ce produit est conçu pour l'installation et l'utilisation dans un rack d'ordinateur avec les portes avant et arrière fermées et sécurisées. Seul un personnel avec la formation technique et de sécurité des produits est autorisé à accéder à la bibliothèque. Ce personnel est désigné par utilisateurs dans la totalité de ce document.

Pour des raisons de sécurité le PIN d'administrateur par défaut doit être changé au cours de la configuration initiale.

Les pièces mobiles dangereuses existent à l'intérieur de ce produit. N'insérez pas d'outils ni partie du corps dans les ouvertures d'un système en marche.

The main components are:

- COMBACK ARION Base
- COMBACK ARION Expansion

#### Product Warranty Caution

The customer should only perform the service and repair actions on the tape library components as described in this document. Any other actions needed should only be performed by an authorized service center.

The warranty for the tape library shall not apply to failures of any unit when:

- The tape library is repaired or modified by anyone other than the manufacturer's personnel or approved agent.

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 5 of 49

- The tape library is physically abused or used in a manner that is inconsistent with the operating instructions or product specification defined by the manufacturer.
- The tape library fails because of accident, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, modification, or service by anyone other than the factory service center or its approved agent.
- The tape library is repaired by anyone, including an approved agent, in a manner that is contrary to the maintenance or installation instructions supplied by the manufacturer.
- The manufacturer's serial number tag is removed.
- The tape library is damaged because of improper packaging on return.

Warranty will become immediately void in the event of unauthorized repairs or modifications.

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 6 of 49	

## 2 General Warnings

### 2.1. Document Conventions:

	<b>WARNING</b>	Indicates that failure to follow directions could result in bodily harm or death.
	<b>CAUTION</b>	Indicates that failure to follow directions could result in damage to equipment or data.
	<b>IMPORTANT</b>	Provides clarifying information or specific instructions.
	<b>NOTE</b>	Provides additional information.
	<b>TIP</b>	Provides helpful hints and shortcuts.
	<b>AVERTISSEMENT</b>	Le non-respect de ces instructions expose l'utilisateur à des risques potentiellement très graves.
	<b>ATTENTION</b>	Le non-respect de ces instructions comporte des risques tant pour le matériel que pour les informations qu'il contient.
	<b>IMPORTANT</b>	Apporte une clarification ou fournit des instructions spécifiques.
	<b>REMARQUE</b>	Fournit des informations complémentaires..
	<b>ASTUCE</b>	Conseils et raccourcis utiles.

### 2.2. General Product Warnings

	<b>DANGER</b>	<p><b>High voltage</b> <b>Risk of electric shock</b></p> <ul style="list-style-type: none"> <li>▪ Do not remove power supply covers. No user-serviceable parts are inside unless specifically identified.</li> <li>▪ Refer servicing to qualified service personnel.</li> </ul>
	<b>DANGER</b>	<p><b>Tension élevée</b> <b>Risque de choc électrique</b></p> <ul style="list-style-type: none"> <li>• Ne pas retirer le couvercle de l'alimentation. Aucune pièce réparable par l'utilisateur ne se trouve à l'intérieur à moins que celle-ci ne soit</li> </ul>

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 7 of 49	

spécifiquement identifiée.

- Confier toute réparation à un personnel qualifié.



**MECHANICAL  
HAZARD**

**Danger** Risk of hand pinching, can trap hands, fingers and cause serious injury. Keep hands clear during operation.



**DANGER  
MÉCANIQUE**

**Danger** Risque de se coincer la main et de se coincer les mains ainsi que les doigts le tout pouvant entraîner de graves blessures. Gardez les mains à l'écart pendant le fonctionnement.



**WARNING**

**Product Weight**

**Risk of personal injury**

Before lifting a module:

- Observe local health and safety requirements and guidelines for manual material handling.
- Remove all tapes to reduce the weight.
- Remove all tape drives to reduce the weight.
- Obtain adequate assistance to lift and stabilize the module during installation or removal.

**Risk of damage to devices**

When placing a module into or removing the module from a rack:

- Extend the rack's levelling jacks to the floor.
- Ensure that the full weight of the rack rests on the levelling jacks.
- Install stabilizing feet on the rack.
- Extend only one rack component at a time.

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 8 of 49



## **AVERTISSEMENT** Poids du produit

### **Risque de blessure**

Avant de soulever un module:

- Respectez les règles locales de santé et de sécurité au travail ainsi que les instructions concernant la manipulation du matériel.
- Retirez toutes les cartouches à bande pour réduire le poids
- Retirez toutes les lecteurs de bande pour réduire le poids
- Faites-vous assister de manière adéquate pour soulever et stabiliser le périphérique pendant l'installation ou le retrait.

### **Risque d'endommager les périphériques**

Lors de l'insertion d'un module dans un rack ou du retrait d'un module d'un rack:

- Les vérins de mise à niveau doivent être en contact avec le sol.
- Les vérins de mise à niveau doivent supporter tout le poids du rack.
- Installez le kit de mise à niveau sur le rack.
- Déployez un seul élément de rack à la fois. Si vous déployez plusieurs éléments à la fois, vous risquez de compromettre la stabilité du rack.



## **CAUTION**

### **Static Sensitive**

#### **Risk of damage to devices**

- A discharge of static electricity damages static-sensitive devices or micro circuitry.
- Proper packaging and grounding techniques are necessary precautions to prevent damage.



## **ATTENTION**

### **Électricité statique**

#### **Risque d'endommager les périphériques par une décharge d'électrostatique.**

- Une décharge d'électricité statique peut endommager les circuits imprimés du système ou les autres périphériques sensibles aux décharges électrostatiques.
- Un emballage approprié et une mise à la terre constituent les précautions nécessaires pour éviter tout dommage.

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 9 of 49



## NOTE

- Ventilation – Place the product in a location that does not interfere with proper ventilation.
- Heat – Place the product in a location away from heat sources.
- Power sources – Connect the product to a power source only of the type directed in the operating instructions or as marked on the product.
- Power cord protection – Place the AC line cord so that it is not possible to be walked on or pinched by items placed upon or against it.
- Object and liquid entry – Insure that objects do not fall onto and that liquids are not spilled into the product's enclosure.



## REMARQUE

- Ventilation – Placez le produit dans un endroit qui n'interfère pas avec une ventilation approprié.
- Chaleur – Placez le produit dans un endroit loin de sources de chaleur.
- Alimentation électrique – Veuillez ne brancher le produit qu'à une source d'alimentation correspondant aux instructions figurant dans le mode d'emploi ou comme directement indiqué sur le produit.
- Protection du cordon d'alimentation – Placez le cordon d'alimentation principal de sorte qu'il ne soit pas possible de marcher dessus ou d'être écrasé par des objets placés sur ou contre.
- Pénétration d'objets et de liquide – S'assurez que des objets ne tombent pas sur le boîtier du produit et que des liquides ne soient pas déversés dans le boîtier du produit

### 3 Product Overview

	<b>WARNING</b>	Only trained personnel should operate this equipment. Read all documentation and procedures before installation or operation. This product is intended for installation and operation in a restricted area. Only personnel with technical and product safety training should be provided access to the library. Such personnel are referred to as users throughout this document. Do not insert any tools or any part of your body into openings of an operating system.
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All COMBACK ARION installations begin with the 3U Base Module, with capacity for **40 tape** cartridges and 3 half-height LTO tape drives.

COMBACK ARION is expandable, allowing a user to grow their tape storage capacity as their data requirements increase. As data storage needs grow, COMBACK ARION can also grow by adding one or more 3U Expansion Modules. Each Expansion Module provides an additional 40 tape cartridges and supports an additional 3 half-height LTO tape drives.

Up to **15 Expansion Modules** can be added to a Base Module, bring the total library capacity to **640 tape cartridges and 48 half-height LTO tape drives**.

#### 3.1. Supported Library Configurations – Rackmount Installation

All COMBACK ARION Libraries start with a Base Module. Up to **15 Expansion Modules** can be added as needed to support customer requirements. The architecture has been designed to support a maximum of **7 Expansion Modules above and 8 Expansion Modules below** the Base Module.

Table 1 shows the supported configurations for libraries ranging from one to fourteen total modules.

Module Configuration	Base Module	Expansion Module	Module Location
1 Module Library	1	n/a	n/a
2 Module Library	1	1	1 Expansion Modules above or below Base Module
3 Module Library	1	2	Up to 2 Expansion Modules above or below Base Module
4 Module Library	1	3	Up to 3 Expansion Modules above or below Base Module
5 Module Library	1	4	Up to 4 Expansion Modules above or below Base Module
6 Module Library	1	5	Up to 5 Expansion Modules above or below Base Module
7 Module Library	1	6	Up to 6 Expansion Modules above or below Base Module
8 Module Library	1	7	<b>Up to 7 Expansion Modules above or below Base Module</b>
9 Module Library	1	8	<b>Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</b>
10 Module Library	1	9	<b>Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</b>
11 Module Library	1	10	<b>Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</b>
12 Module Library	1	11	<b>Up to 7 Expansion Modules above or up to 8</b>

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION		<b>3.0</b>	02/06/2023	Page: 11 of 49

			<a href="#">Expansion Modules below Base Module</a>
13 Module Library	1	12	<a href="#">Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</a>
14 Module Library	1	13	<a href="#">Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</a>
15 Module Library	1	14	<a href="#">Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</a>
16 Module Library	1	15	<a href="#">Up to 7 Expansion Modules above or up to 8 Expansion Modules below Base Module</a>

### Example Module Library

The Base Module is depicted by the following image with the Operator Control Panel shown in blue:

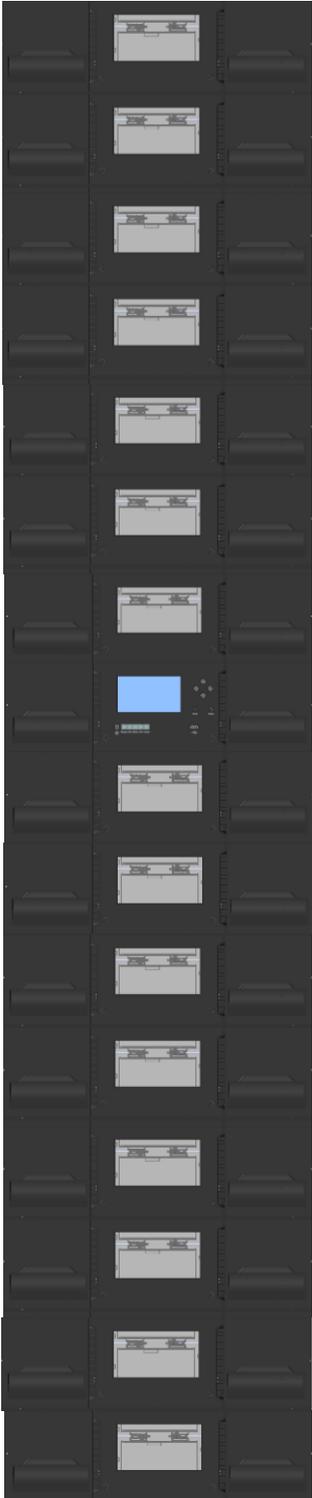


Each Expansion Module is represented by the following image with a large clear viewing window in the center.



	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 12 of 49

The following maximum 48U library configurations must be installed like shown below:



<b>COMBACK ARION 3U Library Installation Guide</b>			
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 13 of 49

### 3.2. Supported Library Configurations – Tabletop Installation

One Base module can be installed in a tabletop configuration. The Base Module requires 4 feet to avoid damage to the surface and avoid slippage of the module on the surface.

Module Quantity	Supported Library Configurations
<b>1 Module Library</b> Base Module	

### 3.3. Supported Module Configurations with Legacy Serial ADI Drive Sleds

COMBACK ARION supports serial ADI sleds from FlexStor and MultiStak libraries. One drive power board (DC-DC converter) is required in each module that includes one or more serial ADI drive sleds. Table 2 describes the supported serial ADI configurations for each module type – Base Module and Expansion Module.

Module Type	Power Supplies	Drive Power Boards	Tape Drives
Base	<b>1 (standard) or 2 (redundant)</b>	0 (standard)	0
		1	Up to 3
Expansion	<b>0 (standard)</b>	0 (standard)	0
	<b>1 (required with 1 or more drives) or 2 (redundant)</b>	0 (standard)	0
		1	Up to 3

### 3.4. Supported Tape Drives

COMBACK ARION was developed to integrate industry-standard LTO Ultrium tape drives from both HP and IBM.

Mixed drive generations and mixed interfaces are supported within a single library and within a single module.

Listed below are the tape drives that have been implemented and qualified for use in COMBACK ARION.

IBM LTO Drives	HP LTO Drives
LTO-6 Half-Height FC Single Port LTO-6 Half-Height FC Dual Port	LTO-6 Half-Height FC Dual Port
LTO-6 Half-Height SAS Dual Port	LTO-6 Half-Height SAS Dual Port
LTO-7 Half-Height FC Single Port LTO-7 Half-Height FC Dual Port	n/a
LTO-7 Half-Height SAS Dual Port	n/a
LTO-8 Half-Height FC Single Port LTO-8 Half-Height FC Dual Port LTO-8 Full-Height FC Dual Port	n/a

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

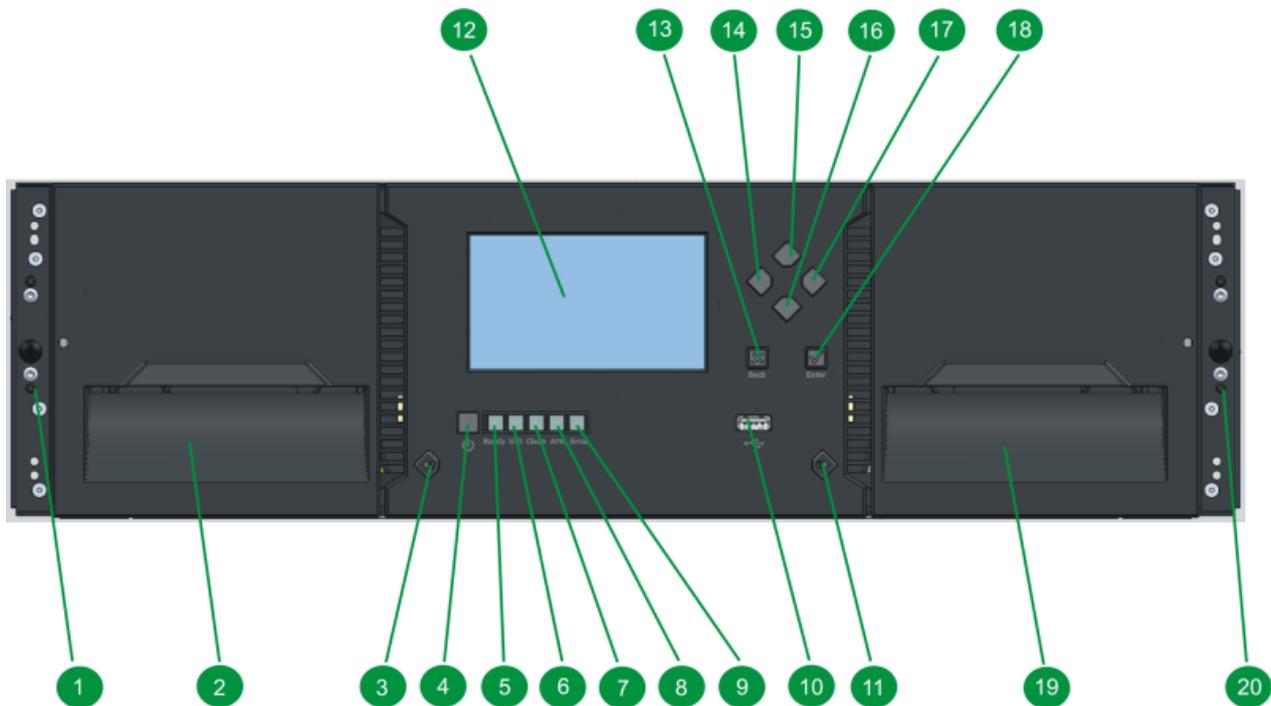
3.0

02/06/2023

Page: 14 of 49

LTO-8 Half-Height SAS Dual Port	n/a
LTO-9* Half-Height FC Dual Port	n/a
LTO-9* Full Height FC Dual Port	n/a
LTO-9* Half-Height SAS Dual Port	n/a

## 3.5. Front Panel



1	Left Magazine Emergency Release Access Hole	
2	Left Magazine Access Handle	
3	Left Magazine Unlock Button	
4	Power Button	Base Module Only
5	Unit Identification LED, Blue	Base Module Only
6	Ready LED, Green	Base Module Only
7	Clean LED, Amber	Base Module Only
8	Attention LED, Amber	Base Module Only
9	Error LED, Amber	Base Module Only
10	USB Port	Base Module Only
11	Mailslot/Right Magazine Unlock Button	
12	Operator Control Panel (OCP) Display	Base Module Only
13	Back/Return Button	Base Module Only
14	Navigation Button - Left	Base Module Only
15	Navigation Button - Up	Base Module Only
16	Navigation Button - Down	Base Module Only
17	Navigation Button - Right	Base Module Only
18	Enter Button	Base Module Only
19	Mailslot/Right Magazine Access Handle	
20	Right Magazine Emergency Release Access Hole	

# COMBACK ARION 3U Library Installation Guide



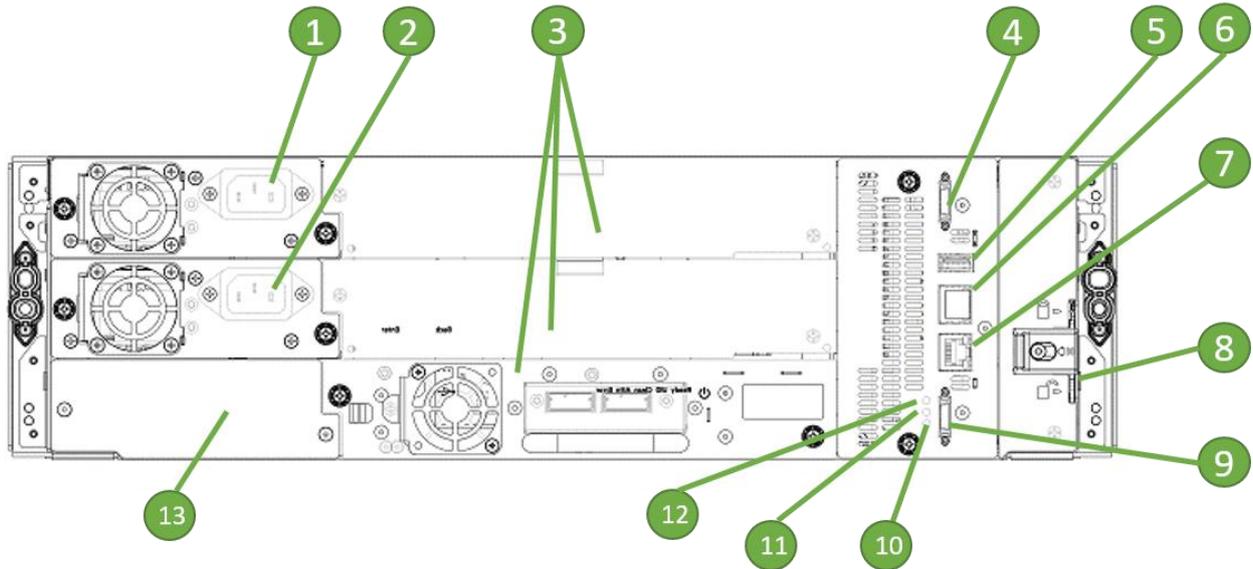
COMBACK ARION

3.0

02/06/2023

Page: 15 of 49

## 3.6. Rear Panel



1	Power Supply 1	Standard on Base Module Optional on Expansion Module
2	Power Supply 2	Optional on Base Module Optional on Expansion Module
3	Half-Height Tape Drive Bays	
4	Upper Expansion Module Connection Port	
5	USB Port	Optional on Base Module Only
6	Ethernet Port A	Base Module Only
7	Ethernet Port B	Optional on Base Module Only
8	Module Alignment Mechanism	
9	Lower Expansion Module Connection Port	
10	Unit Identifier LED, Blue	
11	Controller Error LED, Yellow	
12	Controller Health Status LED, Green	
13	Product Serial Number Tag Location	

# COMBACK ARION 3U Library Installation Guide



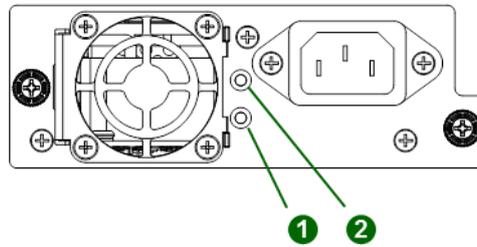
COMBACK ARION

3.0

02/06/2023

Page: 16 of 49

## 3.7. Power Supply Rear Panel LEDs



1	Green	Module Powered On
2	White	AC power connected, but Module Powered Off

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

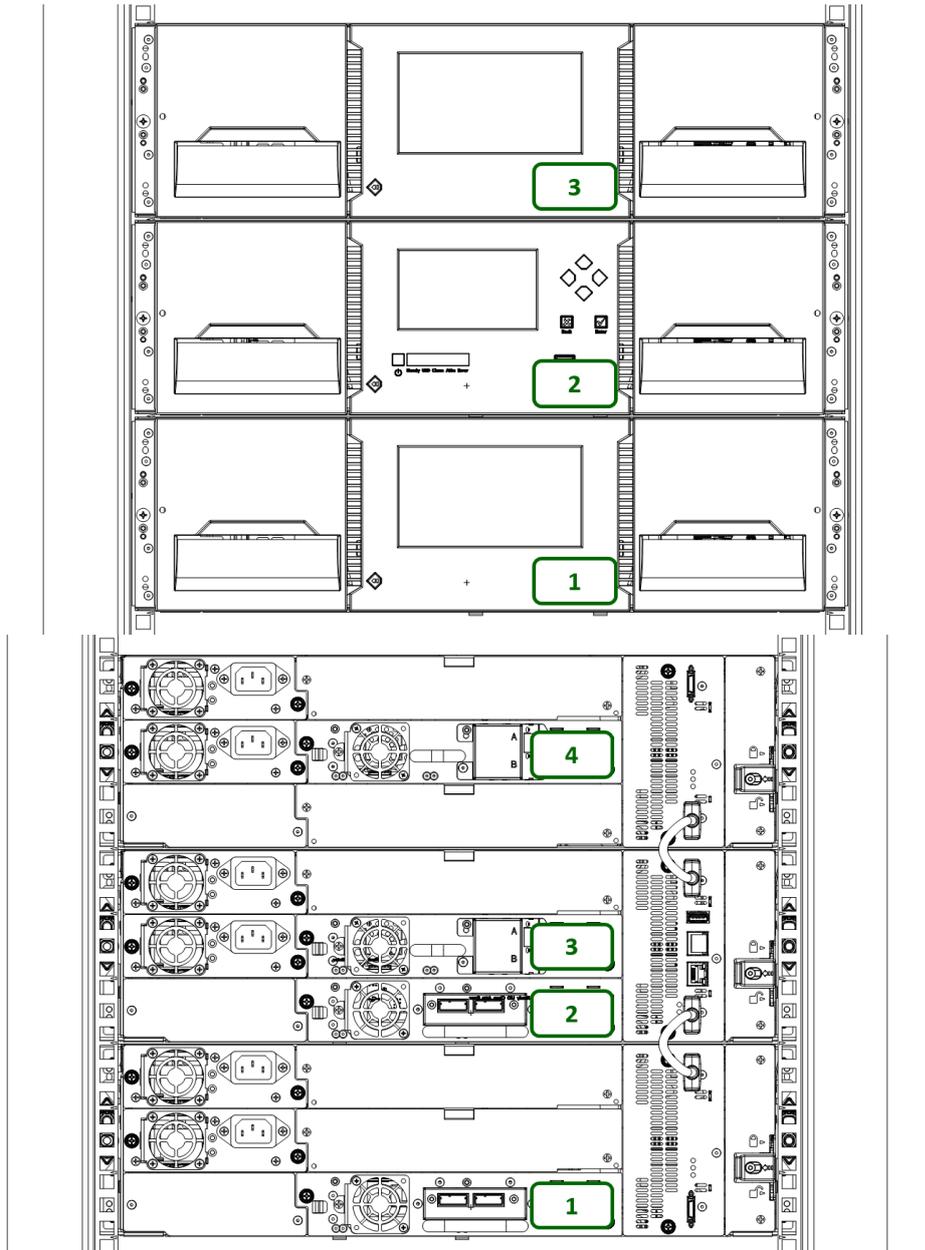
3.0

02/06/2023

Page: 17 of 49

## 3.8. Element Numbering

The library will generally display logical element numbering of modules, storage slots and tape drives starting with number one from the bottom up.



		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 18 of 49	

## 4 Installing the Library

### 4.1. Planning Installation

- Choose a location for the library. See "[Location Requirements](#)".
- Plan the SAS or Fibre Channel configuration and obtain the necessary cables. See "[SAS Configuration Requirements](#)" or "[Fibre Channel Configuration Requirements](#)".
- For rack installations, plan the rack layout. See "[Planning the Module and Rack Layout](#)".
- Internal IP Range Selection

### 4.2. Location Requirements

	<b>NOTE</b>	<ul style="list-style-type: none"> <li>• The library was designed for both rack and tabletop installation.</li> <li>• Rack installations must use the provided rack rails.</li> <li>• 1 Module tabletop installations require no additional hardware.</li> <li>• 2 Module (Base Module + 1 Expansion Module) tabletop installations must use the optional table top kit.</li> <li>• Select a location with access to the host server.</li> <li>• Choose a location that meets the criteria in the table below.</li> </ul>
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<i>Criteria</i>	<i>Definition</i>
<i>Rack Requirements</i>	<i>Standard 19-inch rack (minimum depth of 1 meter) with an appropriate # of U's (Rack Units) of clearance for the planned module quantity</i>
<i>Rack Space Requirements</i>	<i>3U for the Base Module and 3U for each Expansion Module</i>
<i>Room Temperature</i>	<i>10-35° C (50-95° F)</i>
<i>Power Source</i>	<ul style="list-style-type: none"> <li>◆ <i>AC Power Voltage: 100-240 VAC</i></li> <li>◆ <i>Line Frequency: 50-60 Hz</i></li> <li>◆ <i>Library Located near AC Outlet(s)</i></li> </ul> <p><i>The AC power cord is the library's main AC disconnect device and must be easily accessible at all times.</i></p>
<i>Air Quality</i>	<ul style="list-style-type: none"> <li>◆ <i>Place the library in an area with minimal sources of particulate contamination</i></li> <li>◆ <i>Avoid areas near frequently used doors and walkways, stacks of supplies that collect dust, printers, and smoke-filled rooms</i></li> <li>◆ <i>Excessive dust and debris can damage tapes and tape drive</i></li> </ul>
<i>Humidity</i>	<i>20-80 percent RH non-condensing</i>

### 4.3. SAS Configuration Requirements

Serial Attached SCSI (SAS) is a computer bus technology mainly used to transfer data to and from storage

devices, including disk drives and tape drives. SAS is designed to transfer data at up to 6 Gbps.

SAS uses serial connections, with a direct connection between the host server and each of the storage devices. This eliminates the need to configure SCSI busses and assign SCSI IDs, as is required for parallel SCSI devices.

The host server must have a **SAS Host Bus Adapter (HBA)** with an external connector. The HBA uses multiple **Logical Unit Numbers (LUNs)** to communicate with the library. Verify that your HBA supports multiple LUNs, as most RAID controllers do not. Most SAS HBA ports have four SAS channels. A tape drive uses one channel, so each HBA port can support up to four tape drives. You can use a cable with one connector on each end, but only one channel will be used.

Supported speeds by drive generation are shown in the table below.

#### *Supported SAS Speeds*

LTO Generation	Supported Speeds
LTO-6	1.5 Gbps, 3 Gbps, 6 Gbps
LTO-7	1.5 Gbps, 3 Gbps, 6 Gbps
LTO-8	1.5 Gbps, 3 Gbps, 6 Gbps
LTO-9	3 Gbps, 6 Gbps, 12 Gbps

	<b>CAUTION</b>	High quality SAS cables rated at the transfer rate the SAS drives are required. Always verify that the SAS cable you are using is rated for the data transfer speed of the interface of your components. SAS cables described as "equalized" may not support 6 Gb/s data rates and should not be used with LTO-5 or later generation tape drives unless these cables are verified for 6 Gb/s data rates.
---	----------------	--

	<b>CAUTION</b>	The library has one or more mini-SAS connectors on each SAS tape drive. Mini-SAS connectors are keyed. Do not force a SAS cable's mini-SAS connector into the tape drive as it might be keyed differently.
---	----------------	--

A SAS tape drive is identified by a unique identifier called a **World Wide Name (WWN)** or **World Wide Identifier (WWID)**. The library assigns the WWID to the drive bay. When a tape drive is replaced, the WWID is re-assigned to the new tape drive.

The operating system tracks the WWID for the tape drive on each HBA channel. Each of the drive connectors on the fan-out cable is associated with an HBA channel. Once a tape drive has been plugged in, it should remain on the same channel to retain the association between the HBA channel and WWID.

## **4.4. Fibre Channel Configuration Requirements**

The **Fibre Channel (FC)** tape drive can be connected directly to the server with a **Host Bus Adapter (HBA)** or through a storage area network (SAN).

The installation requires one Fibre Channel cable for each tape drive. The tape drives all utilize an LC-style connector. Some drives will have two FC ports, but only one cable connection is needed per drive.

The cable can be connected to either drive FC port.

Supported speeds by drive generation are listed in the table below.

**Table 1: Supported Fibre Channel Speeds**

LTO Generation	Supported Speeds
LTO-6	2 Gbps, 4 Gbps, 8 Gbps
LTO-7	2 Gbps, 4 Gbps, 8 Gbps
LTO-8	2 Gbps, 4 Gbps, 8 Gbps
LTO-9	2 Gbps, 4 Gbps, 8 Gbps

	<b>COMBACK ARION 3U Library Installation Guide</b>	
COMBACK ARION	<b>3.0</b>	02/06/2023
		Page: 20 of 49



**NOTE**

- Use an appropriate HBA for your tape drive due to performance requirements.  
A lower Gbps HBA might result in performance degradation when moving highly compressible data to a higher Gb tape drive.
- In a SAN installation, all switches between the host and the library must be of the appropriate type.  
A lower Gb switch in the path may result in performance degradation. Configure zoning so only the backup servers may access the library.

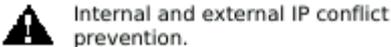
### 4.5. Planning Module and Rack Layout

If possible, install the Base Module in the middle of the rack to provide space for the permitted 8 Expansion Modules above and 7 Expansion Modules below. See **5.1 Supported Library Configurations** for additional details.

### 4.6. Internal IP Range Selection

For internal communication between modules the tape library uses an Ethernet connection with an internal IP address range. To prevent any conflict between the internal IP address range and the external IP addresses it is required to select the internal IP range before the tape library gets connected to the external Ethernet port.

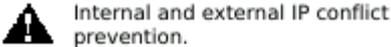
The Values must be in the following format: **RANGE=192.0.2**



Please select an IP-Range which is not used by your environmental network:



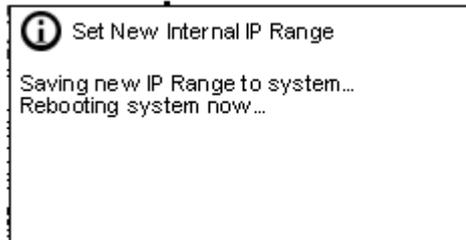
Please note: the last section of the IP address is not set because it will be set internally. The file will be created through the Operator Control Panel (OCP) IP Range selection page when the Stack starts for the very first time or if the unit was reset to Manufacturing Defaults / Reset via OCP or Remote Management Interface (RMI).



Please select an IP-Range which is not used by your environmental network:

- 192.0.2.0/24
- 198.51.100.0/24
- 203.0.113.0/24

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 21 of 49



## 4.7. Host Preparation



### CAUTION

#### Static Sensitive

#### Risk of damage to devices

- A discharge of static electricity damages static-sensitive devices or micro circuitry.
- Proper packaging and grounding techniques are necessary precautions to prevent damage.



### ATTENTION

#### Électricité statique

#### Risque d'endommager les périphériques par une décharge d'électrostatique.

- Une décharge d'électricité statique peut endommager les circuits imprimés du système ou les autres périphériques sensibles aux décharges électrostatiques.
- Un emballage approprié et une mise à la terre constituent les précautions nécessaires pour éviter tout dommage.

Follow these general guidelines:

- Check with a system administrator before powering off the host computer.
- For a SAS library, confirm availability or install a SAS HBA that supports multiple LUNs.
- For a direct-attach Fibre Channel library, confirm availability of install an FC HBA.
- For connection of a Fibre Channel library through a compatible switch, verify that sufficient ports are available.

	<b>COMBACK ARION 3U Library Installation Guide</b>	
COMBACK ARION	3.0	02/06/2023
Page: 22 of 49		

## 4.8. Installation Precautions



### WARNING

#### Product Weight

Each COMBACK ARION module weighs more than 20 kg (44 lbs) without drives or tapes and more than 35 kg (77 lbs) with 3 tape drives and 40 tapes.

#### Risk of personal injury

Before moving or lifting a module:

- Observe local health and safety requirements and guidelines for manual material handling.
- Remove all tapes to reduce the weight and to prevent cartridges from falling into the robotics path and damaging the library.
- Remove all tape drives to reduce the weight.
- Obtain adequate assistance to lift and stabilize the module during installation or removal.

#### Risk of damage to devices

When placing a module into or removing the module from a rack:

- Extend the rack's levelling jacks to the floor.
- Ensure that the full weight of the rack rests on the levelling jacks.
- Install stabilizing feet on the rack.
- Extend only one rack component at a time.



### CAUTION

- Do not expose the library to moisture.
- Do not place a module on either the ends or sides as this may cause damage.

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 23of 49



## **AVERTISSEMENT** Poids du produit

Chaque COMBACK ARION module de bibliothèque pèse 20 kg sans média ni lecteur de bande, et 35 kg avec média (40 cartouches) et trois lecteurs de bande. Lors du déplacement de la bibliothèque, pour réduire les risques de blessures ou de détérioration du périphérique :

- Respectez les règles locales de santé et de sécurité au travail ainsi que les instructions concernant la manipulation du matériel.
- Retirez les bandes des lecteurs avant de déplacer un module.
- Retirez toutes les bandes pour réduire le poids global du périphérique et pour empêcher les cartouches de tomber dans le chemin robotique et d'endommager la bibliothèque. Disposez les cartouches de sorte qu'elles réintègrent leur emplacement d'origine.
- Faites-vous assister pour soulever et stabiliser le périphérique pendant l'installation ou le retrait.



## **ATTENTION**

L'équipement monté sur glissière/rail ne doit pas être utilisé comme étagère ou espace de travail.

### **4.9. Unpacking Base Module and Expansion Modules**

Before unpacking any modules, clear a work surface near the targeted rack or table for installation.



#### **CAUTION**

If the temperature in the room where the library will operate varies by 15° C (30° F) from where the module was stored, allow it to acclimate for at least 12 hours prior to unpacking.

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

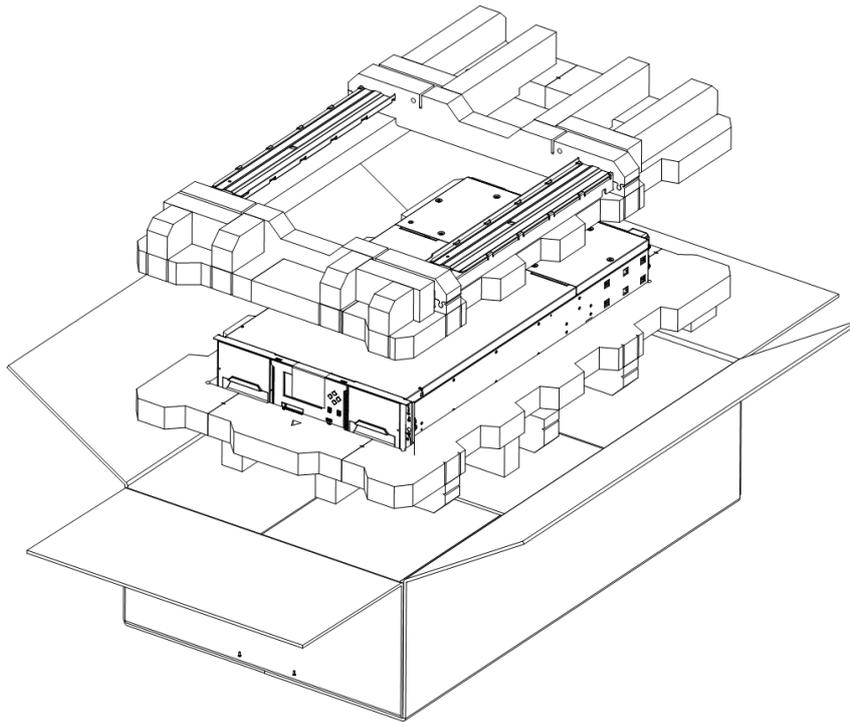
3.0

02/06/2023

Page: 24 of 49

Unpacking a COMBACK ARION Base Module or Expansion Module:

1. Before opening and removing a module from the box, inspect the container for shipping damage.
2. If you notice any damage, report it to the shipping company immediately.
3. Unpack the module from the box and place it on a work table



4. Skip the next steps if you are installing an Expansion Module only
5. The robotics is protected during shipment by an insertion foam which has to be removed prior to installation
6. To remove the top cover plate from the Base Module unlock the top cover using two small screwdrivers

# COMBACK ARION 3U Library Installation Guide

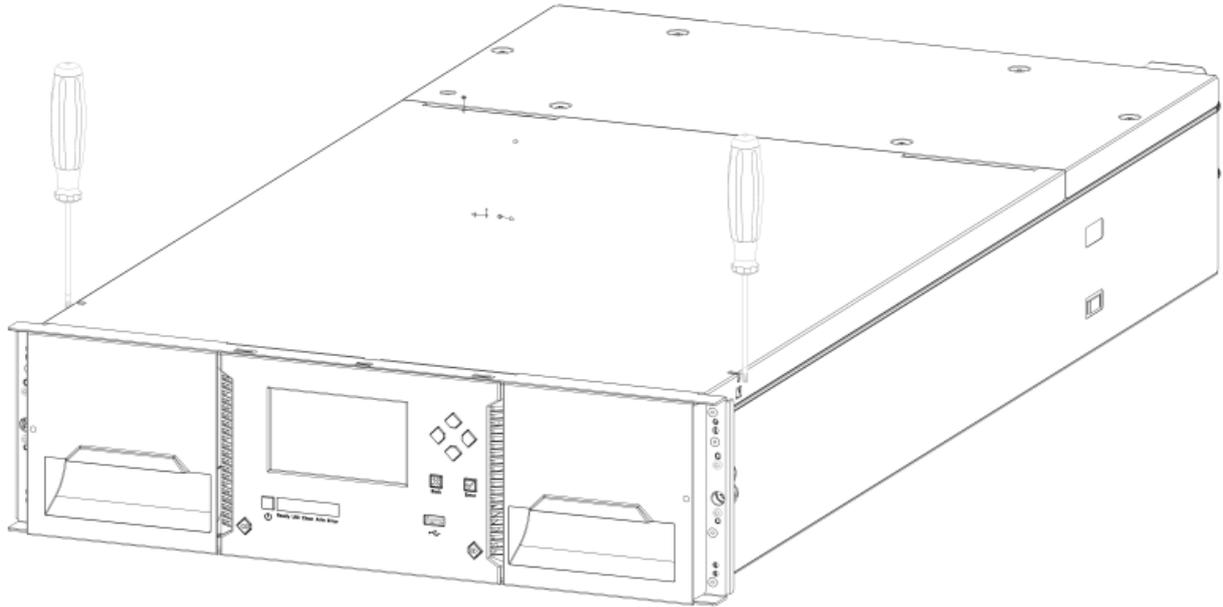


COMBACK ARION

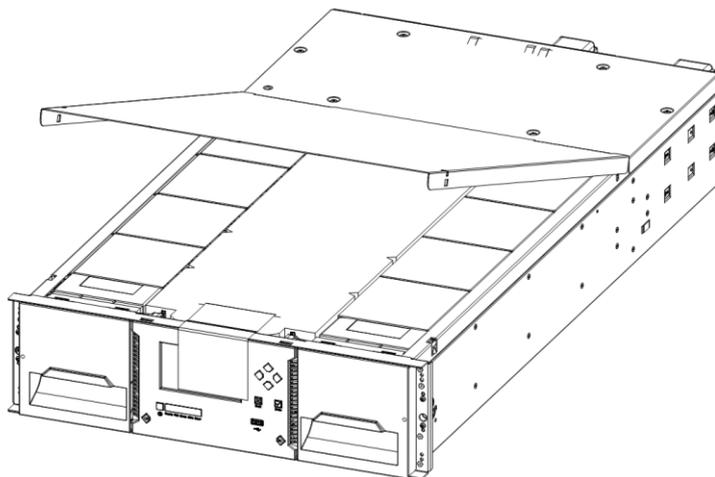
3.0

02/06/2023

Page: 25 of 49



7. Lift the cover front end by about 12 cm and pull gently forward to disengage from the pivot point at the unit center



8. Remove the insertion foam.

# COMBACK ARION 3U Library Installation Guide

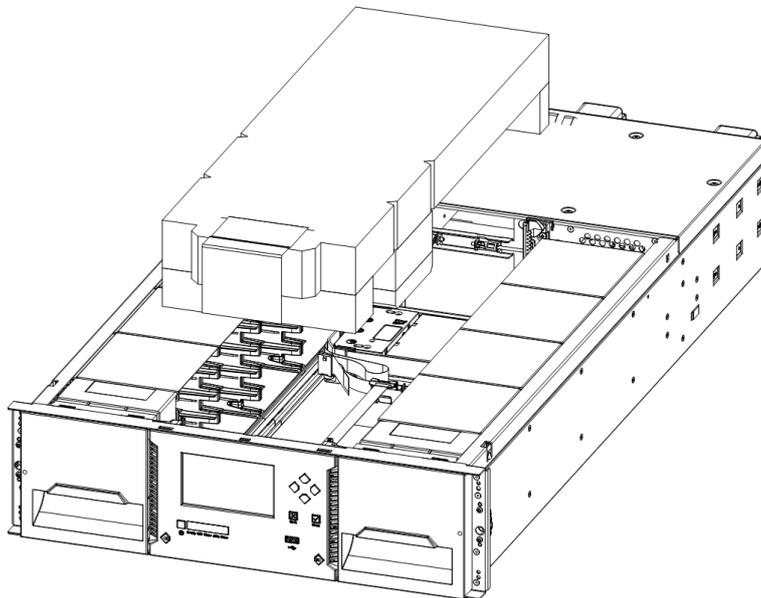


COMBACK ARION

3.0

02/06/2023

Page: 26 of 49



9. If you are installing a Base Module only without an Expansion Module install the top cover again on the Base Module
10. If you want to install a library stack with multiple modules see chapter “Preparing Top and Bottom Modules”
11. Save the packaging materials for future use.



## CAUTION

Do not place a module on either the ends or sides as this may cause damage.

### 4.10. Identifying Library Module Components

If you have unpacked a Base Module, confirm that you have received the following components:

1. Base Module
2. Two Rack Rails
3. Accessory Kit
  - a. One packet of rack mount hardware
  - b. One North American Power Cord
  - c. One European Power Cord

If you have unpacked an Expansion Module, confirm that you have received the following components:

1. Expansion Module
2. Two Rack Rails
3. Accessory Kit
  - a. One packet of rack mount hardware
  - b. Expansion Interconnect Cable

For SAS libraries, you must provide SAS cabling with the correct configuration for your HBA. For Fibre Channel libraries, you must provide one Fibre Channel cable for each tape drive.

	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 27 of 49

## 4.11. Preparing Top and Bottom Modules

Skip this step if you are installing a Base Module only without an Expansion Module.

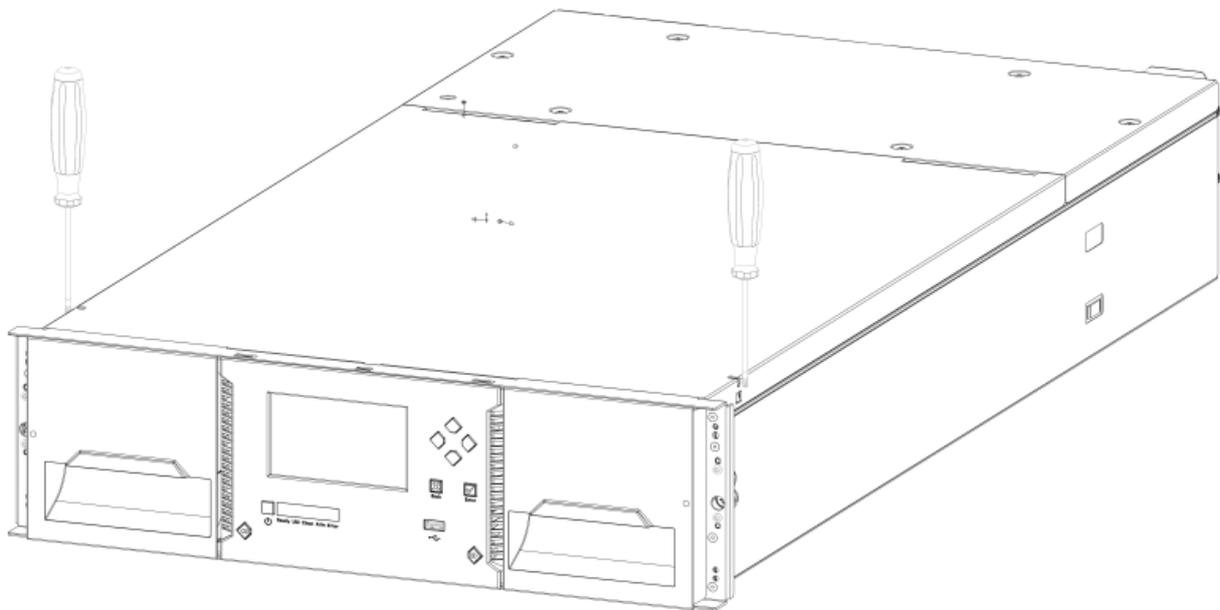
The Base Module has a removable top and bottom covers.

If you are installing one or more Expansion Modules above the Base Module, move the top cover from the Base Module to the Expansion Module that will be installed at the top of the library.

If you are installing one or more Expansion Modules below the Base Module, move the bottom cover from the Base Module to the Expansion Module that will be installed at the bottom of the library.

To move the library top cover plate from the Base Module to an Expansion Module:

1. Remove the library top cover plate from the Base Module.
  - a. Place the Base Module on a work table
  - b. Unlock the top cover using two small screwdrivers.



# COMBACK ARION 3U Library Installation Guide



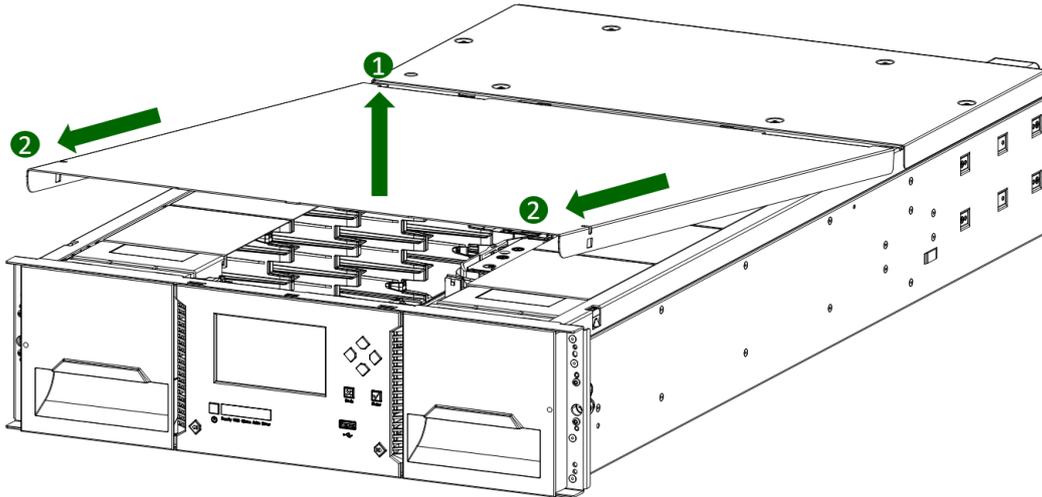
COMBACK ARION

3.0

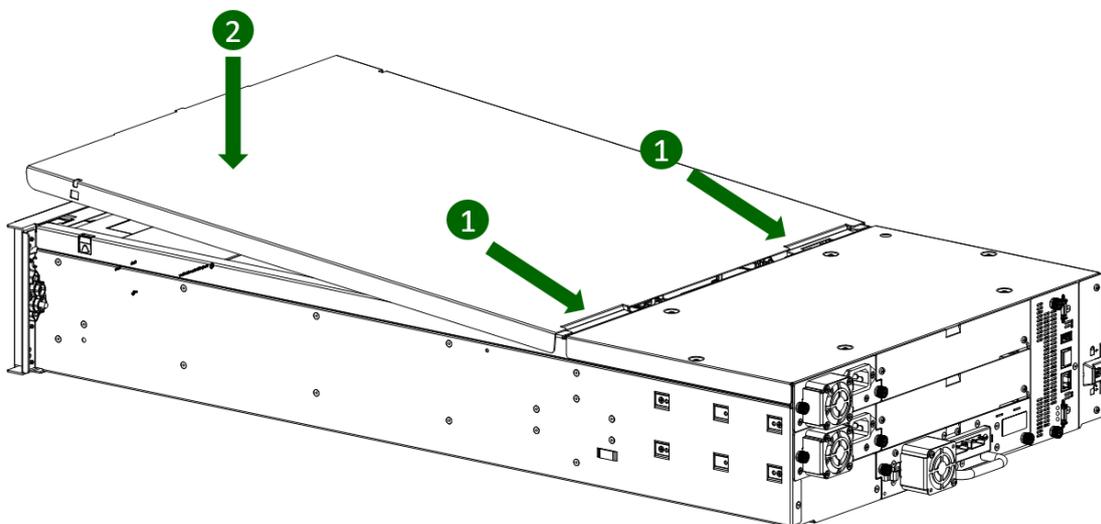
02/06/2023

Page: 28 of 49

- c. Lift the cover front end by about 12 cm
- d. Pull gently forward to disengage from the pivot point at the unit center



- 2. Install top cover on the Expansion Module that will be installed on the top of the library.
  - a. Place the Expansion Module on a work table
  - b. With the front of the top cover raised approximately 12 cm, engage the rear of the cover at the Expansion Module pivot point located at the back of the opening.
  - c. Lower the front of the top cover until the latches engage on both sides.



# COMBACK ARION 3U Library Installation Guide

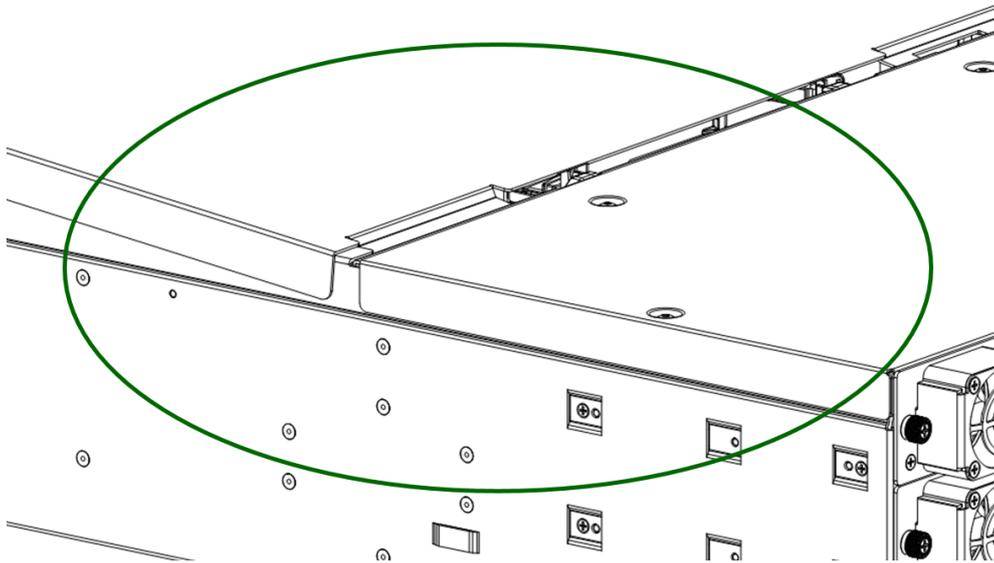


COMBACK ARION

3.0

02/06/2023

Page: 29 of 49



To move the library bottom cover plate from the Base Module to an Expansion Module:

1. Remove the library bottom cover plate from the Base Module.
  - a. Place the Base Module on a work table
  - b. Lift the unit front end by about 16 cm (use unit rear as a pivot edge)
  - c. Support the the bottom cover with one hand. Insert a small flathead screwdriver or Torx screwdriver into the hole and slide about 4 mm sideways to unlock the spring loaded lock.
  - d. Lower the cover front end by about 10 cm and pull gently forward to disengage from the pivot point at unit center
  - e. Remove the cover from the module.

# COMBACK ARION 3U Library Installation Guide

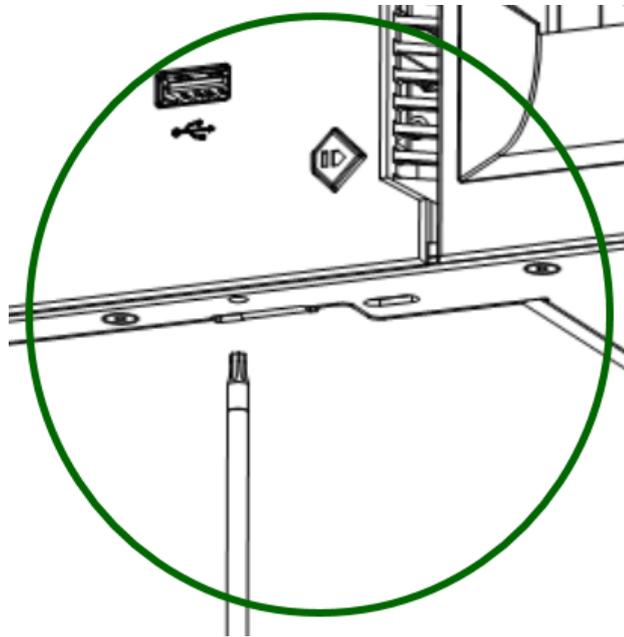
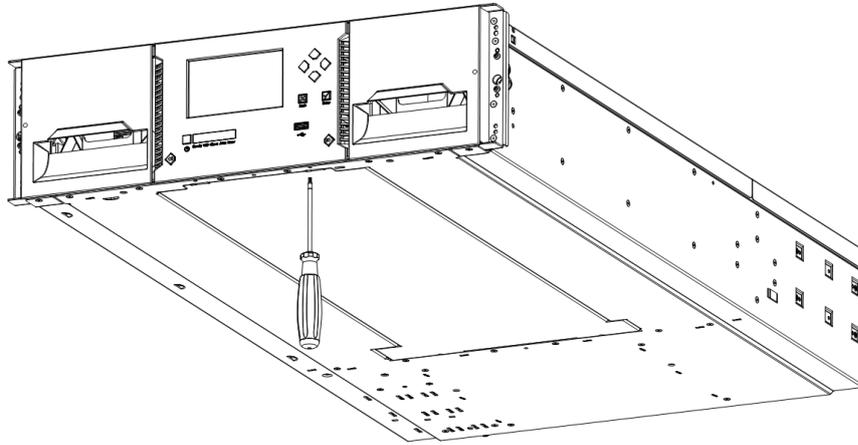


COMBACK ARION

3.0

02/06/2023

Page: 30 of 49



# COMBACK ARION 3U Library Installation Guide

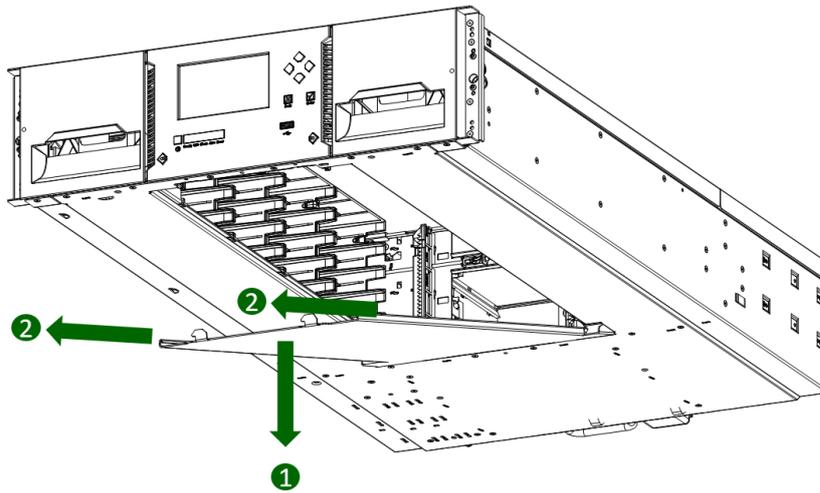


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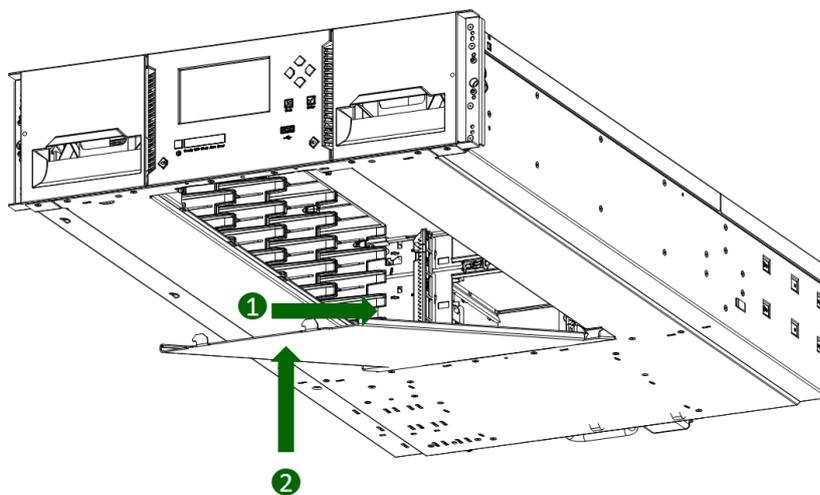
3.0

02/06/2023

Page: 31 of 49



2. Install the library bottom cover plate to the an Expansion Module.
  - a. Place the Base Module on a work table
  - b. Lift the unit front end by about 16 cm (use unit rear as a pivot edge)
  - c. Insert the bottom cover at the center
  - d. Lift up the cover front edge until hard stop and it locks in at the unit front.



	<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 32 of 49

## 4.12. Installing Modules in a Rack

COMBACK ARION modules are easy to install in racks compliant to the EIA 310A Standard, when at least 1 meter deep. You need a #2 Phillips screwdriver for this process.

To locate the rail locations when installing multiple modules:

1. Locate the bottom of the lowest full U where the lowest module will be installed.
2. Continue identifying the locations for any additional module 3U higher.

To install the rails into the rack, starting from the lowest rack location:

1. Locate all the 4 adapter blocks, 4 Philips screws and 2 rackmount rails (LH and RH).

# COMBACK ARION 3U Library Installation Guide



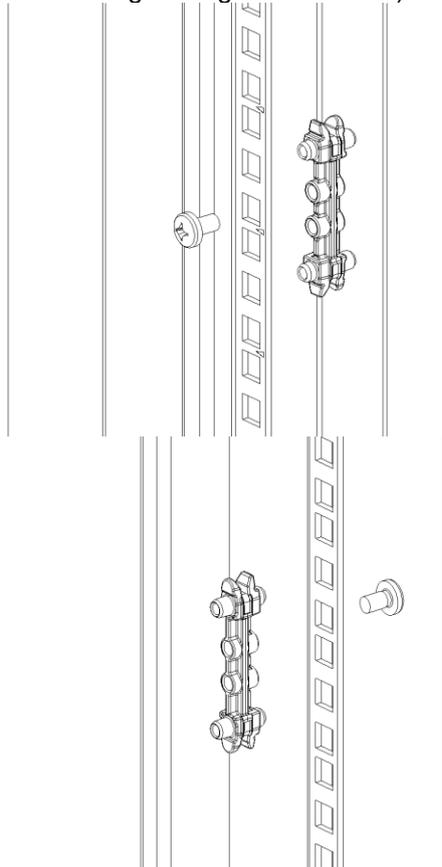
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3.0

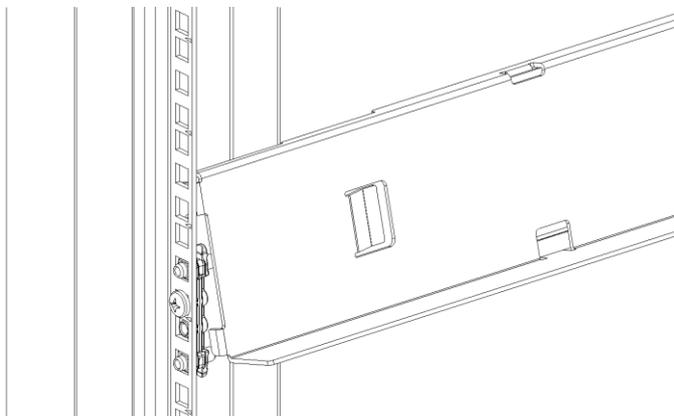
02/06/2023

Page: 33 of 49

2. On the front of the rack, mount an adapter block at the appropriate height to the right and left rack posts. Mount them in the middle square hole of the height unit (The middle of a height unit is the hole between two wide and neighboring division bars.).



3. Repeat step 2 on the right and left rack posts in the rear of the rack.
4. Mount the LH Rackmount rail to the adapter blocks.
5. Repeat step 4 with the RH Rackmount Rail.



# COMBACK ARION 3U Library Installation Guide

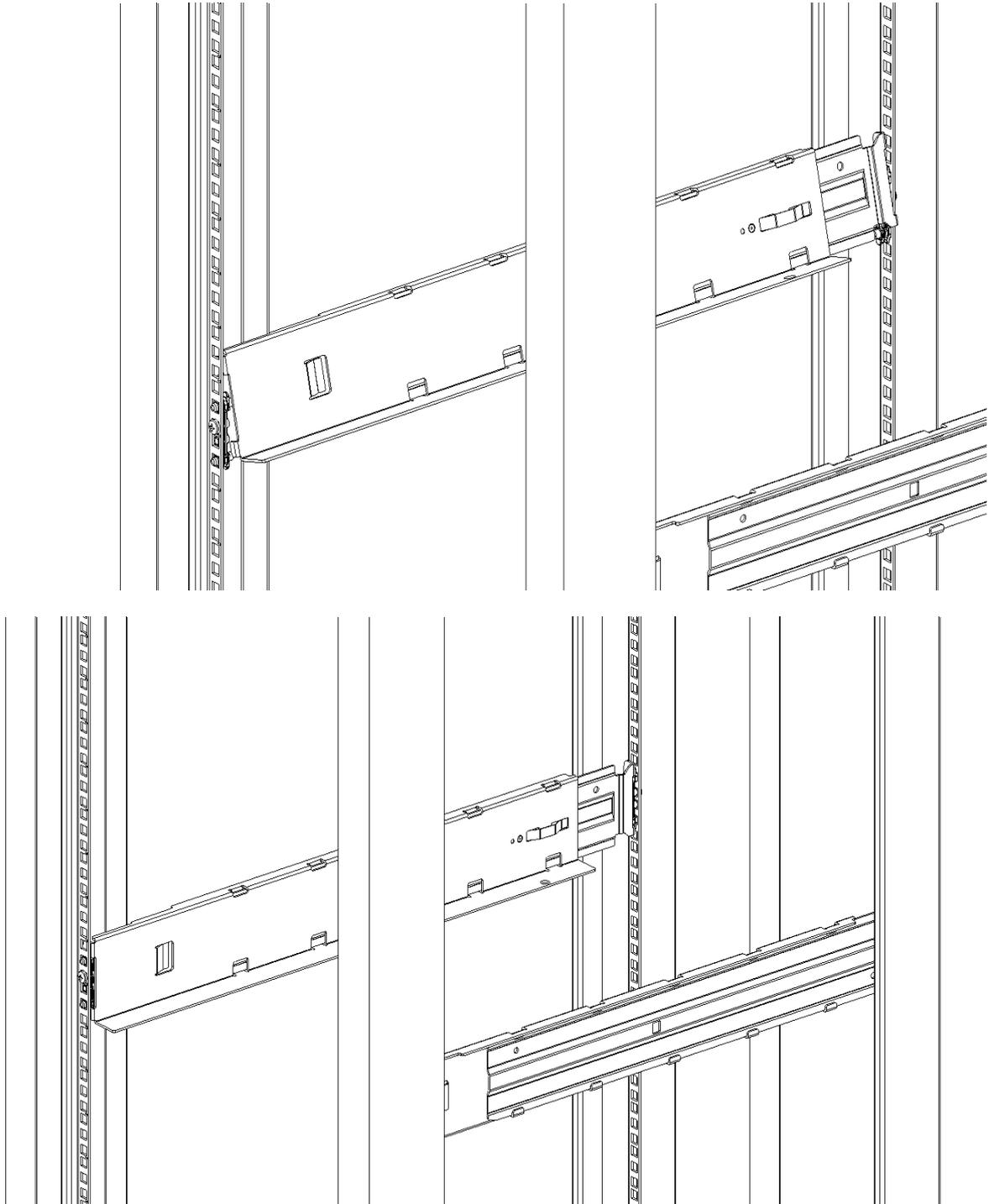


COMBACK ARION

3.0

02/06/2023

Page: 34 of 49



1. Place the library at the front of the rack on the support angles of the sliding rails and push it into the rack to the back stop.

# COMBACK ARION 3U Library Installation Guide

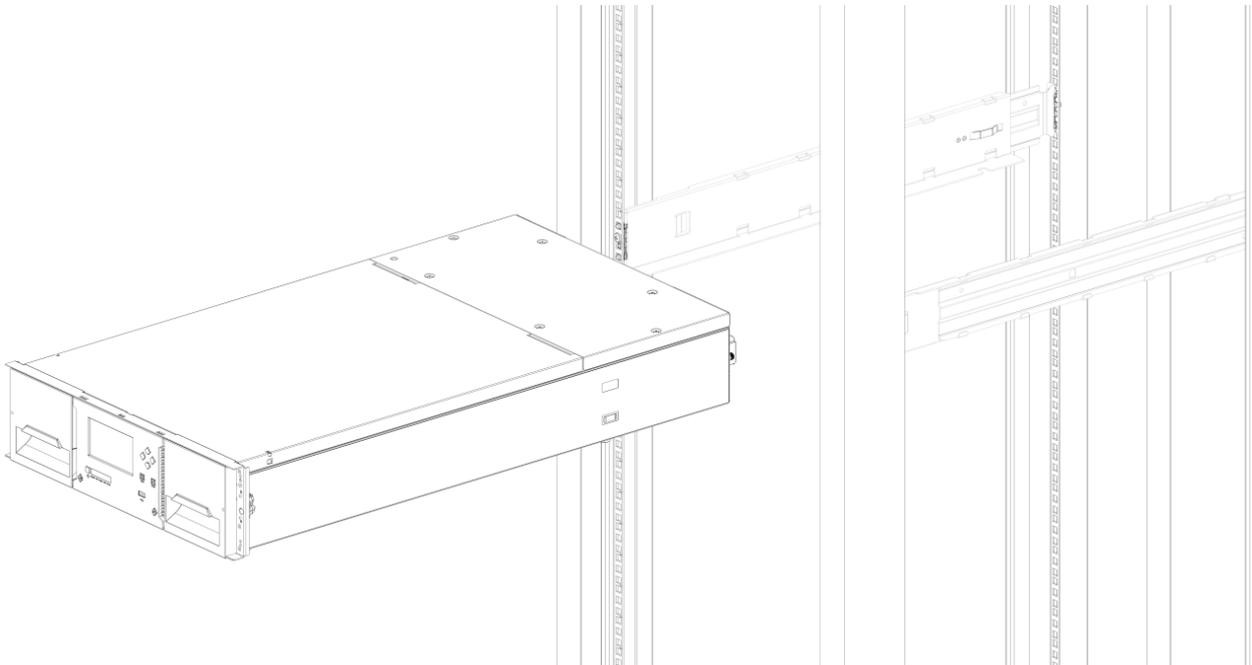


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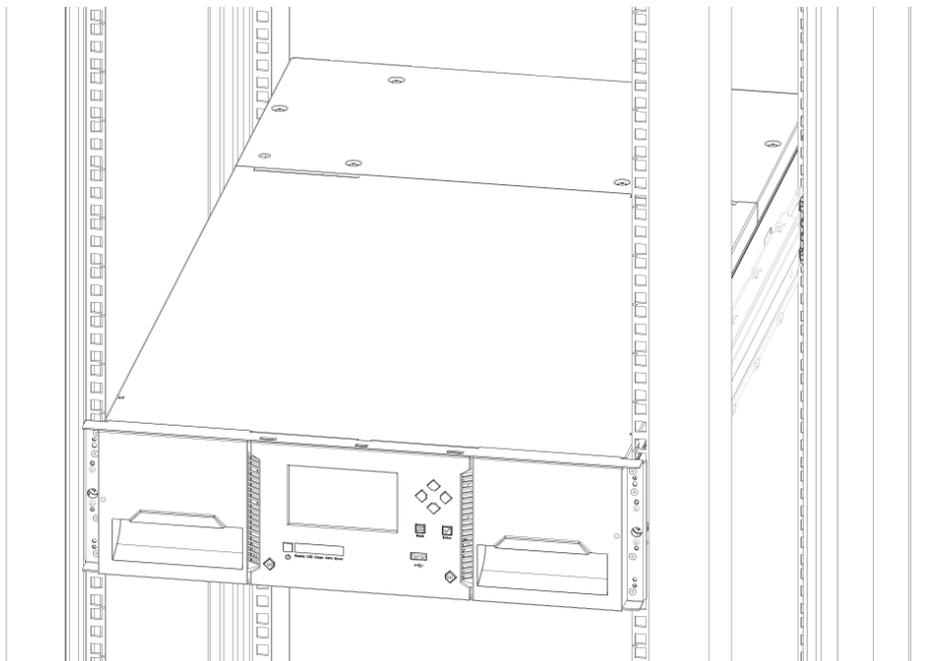
3.0

02/06/2023

Page: 35 of 49



2. If you are installing multiple modules, verify that this module has been installed directly above or below its adjacent module and is contained within the correct 3U volume. The gap between modules must be less than 4 mm.



3. Use a screwdriver for Phillips-recess to tighten the screws on each side of the module.
4. Repeat steps 3 through 5 to install the rest of the modules into the rack

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

3.0

02/06/2023

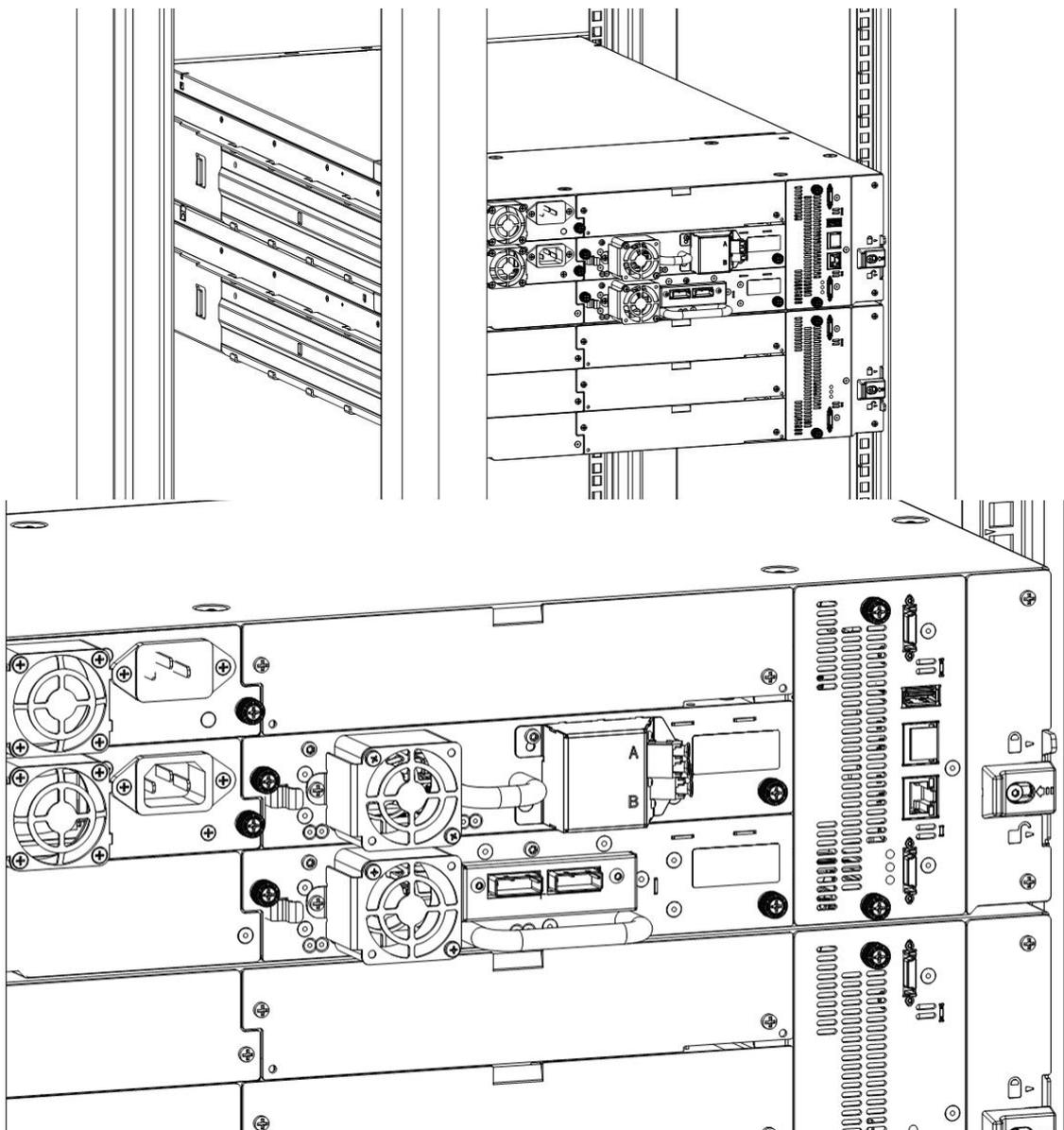
Page: 36 of 49

## 4.13. Aligning and Connecting Modules

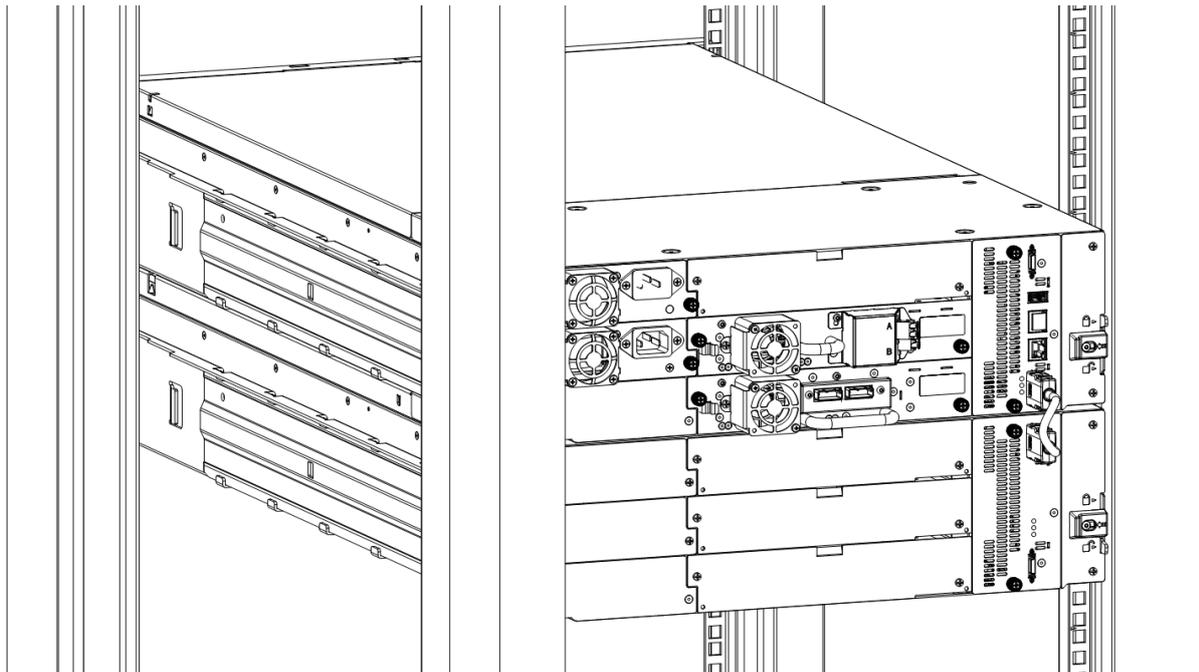
Skip this step if the library does not have Expansion Modules.

Aligning the modules ensures that the robot can move freely between the modules. The library will not operate unless the alignment mechanism is in the locked position.

1. From the front of the library, loosen the screws on each of the modules two full turns.
2. From the back of the library, starting with the bottom pair of modules, align each module with the module below. Repeat for each pair of modules.
  - a. Move the alignment lever to the lock position. If you encounter resistance, adjust the position of the upper module so the pin in the alignment mechanism moves into the mating hole in the lower module.



3. Verify that the lowest module in the library has its alignment mechanism in the unlocked position
4. From the front of the library, tighten the Philips screws on each of the modules to secure the modules to the rack.
5. From the back of the library connect the modules of each pair to its adjacent module using the expansion interconnect cable as shown.



#### 4.14. Installing Tape Drives

1. Locate an appropriate vacant drive bay on the back of the library.
2. To assist in aligning the drive, only remove the drive bay covers for one drive at a time. Remove the face plate covering the drive bay by removing the screws holding it in place. Remove one drive bay cover to install one half-height tape drive.
3. Holding the tape drive by the handle and supporting it from the bottom, slide the tape drive along the alignment rails into the drive bay until it is flush with the back of the library.
4. Tighten the blue captive screws with your fingers to secure the tape drive to the chassis. If the thumbscrews cannot be tightened, verify that the tape drive is aligned properly.



#### CAUTION

All drive bays without tape drives installed must have drive bay covers installed.



#### MECHANICAL HAZARD

**Danger** Risk of hand pinching. Can trap hands, fingers and cause serious injury. Keep hands clear during operation.



#### DANGER MÉCANIQUE

**Danger** Risque de se coincer la main et de se coincer les mains ainsi que les doigts le tout pouvant entrainer de graves blessures. Gardez les mains à l'écart pendant le fonctionnement.

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

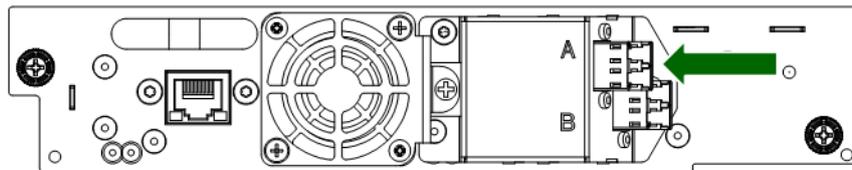
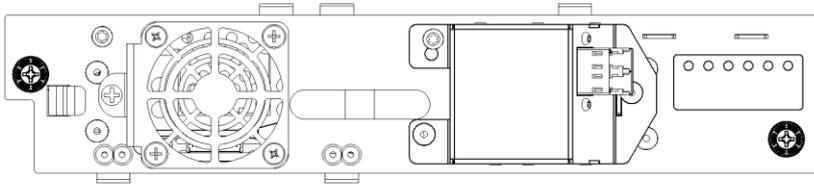
3.0

02/06/2023

Page: 38 of 49

## 4.15. Connecting Fibre Channel Cables

1. Remove the FC port caps if necessary. Attach one end of the FC cable to port A on the tape drive.



2. Attach the other end of the FC cable to a switch or HBA.

## 4.16. Connecting SAS Cables

1. Attach the HBA end of the SAS cable into the connector on the HBA. If you are using a SAS fanout/Hydra cable, the end of the cable with only one connector should be plugged into the HBA.
2. Connect the drive end of the cable.
  - If you are using a cable with a single connector on each end, attach the other end into the connector on the tape drive.
  - If you are using a SAS fanout/Hydra cable, attach one mini-SAS connector into the connector on each tape drive. The unused ends of the SAS fanout/Hydra cable are single channel and not suitable for use with disk arrays. Use the other ends to connect tape drives, or coil and secure them to the rack to minimize stress on the connectors.

# COMBACK ARION 3U Library Installation Guide

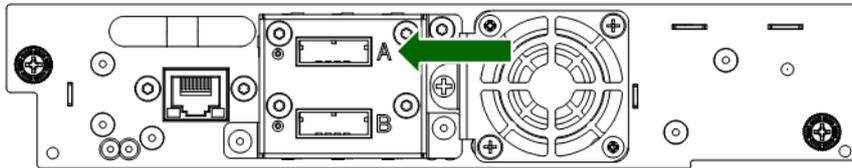
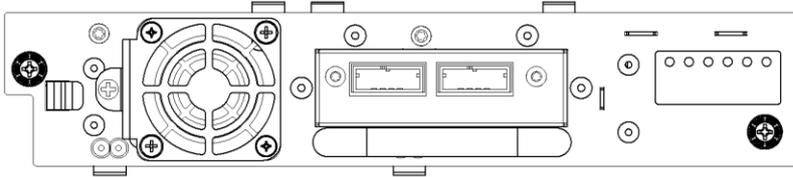


COMBACK ARION

3.0

02/06/2023

Page: 39 of 49



## NOTE

SAS signal rates require clean connections between the HBA and tape drive. Do not use adapters or converters between the HBA and the tape drive. For reliable operation, use a maximum SAS cable length of six meters.

## 4.17. Powering On the Library

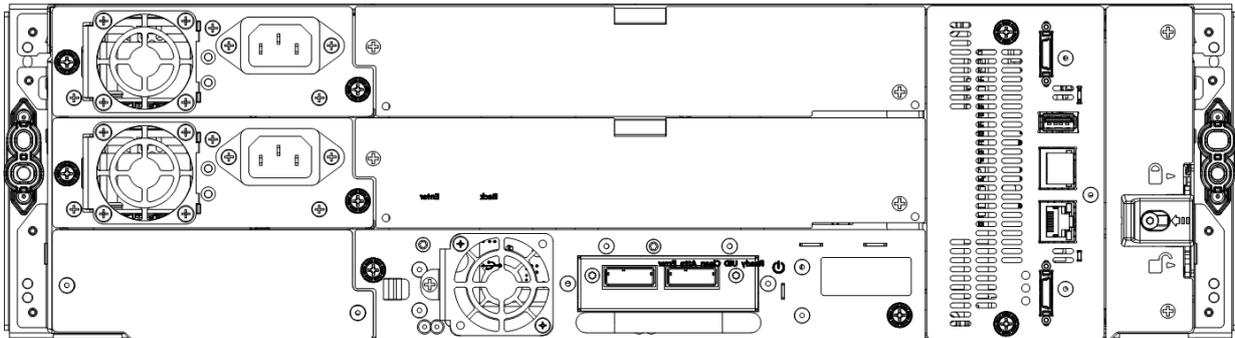
1. Plug the power cables into the power connectors on each module and into power outlets.



## NOTE

The library has dual redundant power supplies. To increase redundancy, plug each power cord into a different AC power circuit.

2. To use the RMI, connect an Ethernet cable from the bottom Ethernet ports on the Base Module controller to your network.
3. Power on the library by pressing the power button on the Base Module just below the OCP; the green light will illuminate. When the library is powered on, it inventories the tape cartridges in the magazines, checks the firmware version on all modules, configures the tape drives, confirms the presence of the existing modules, and searches for any new modules.



1 Power Connectors

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 40 of 49	

<b>2</b>	Ethernet Ports	(Base Module Only)
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## 4.18. Using the Configuration Wizard

Start the Initial Configuration Wizard from the OCP. The wizard will guide you through configuring the basic network configuration, date and time, and setting the administrator PIN. You can skip items and stop the wizard at any time. Once you have configured the network settings, you can initiate the wizard from the RMI to complete the remaining configurations. For Login to the RMI use the default Administrator Password “adm001”

## 4.19. Verifying the Host Connection

To verify the connections between the host computer and the library:

1. Install the application software and/or drivers that are compatible with the library. Backup software packages might require additional software or licensing to communicate with the robotics.
2. Verify the connection between the library and the host using the host server’s operating system utilities.

## 4.20. Loading Tape Cartridges

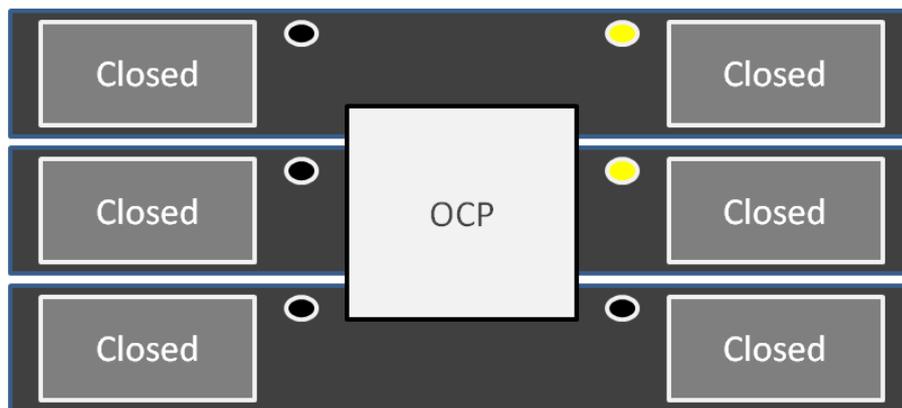
The library will power on without cartridges, but needs cartridges before performing data read and write operations, or any tests or operations that transfer cartridges.

The easiest way to open a mailslot or magazine is to use the magazine unlock buttons on the front panel.

The LED in the translucent button indicates different states of the mailslot or magazine:

- LED steady ON: mailslot is enabled
- LED flashing slowly: unlock operation in process
- LED flashing quickly: mailslot or magazine is unlocked and can be removed

Example: 3-module-library with mailslots enabled on the top 2 modules



### NOTE

You can also open mailslots or magazines through the Operation > Open Mailslot or Operation > Open Magazine page on the RMI. Opening mailslots or magazines through the OCP is not possible.

### 4.20.1 Labeling Tape Cartridges

Barcode labels are recommended in production environments to improve inventory time in the library and ease cartridge handling processes outside the library.

### 4.20.2 Using the Mailslot

If the mailslot is enabled (indicated by the right button LED steady ON), you can use it to load cartridges

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

3.0

02/06/2023

Page: 41 of 49

into the library.

1. Press the right button for less than 3 seconds. This will start the unlock operation for the mailslot, indicated by the LED slowly flashing.
2. When the mailslot is unlocked the LED starts quickly flashing
3. Pull out the mailslot from the library. As soon as the mailslot is pulled out, the LED switches OFF.



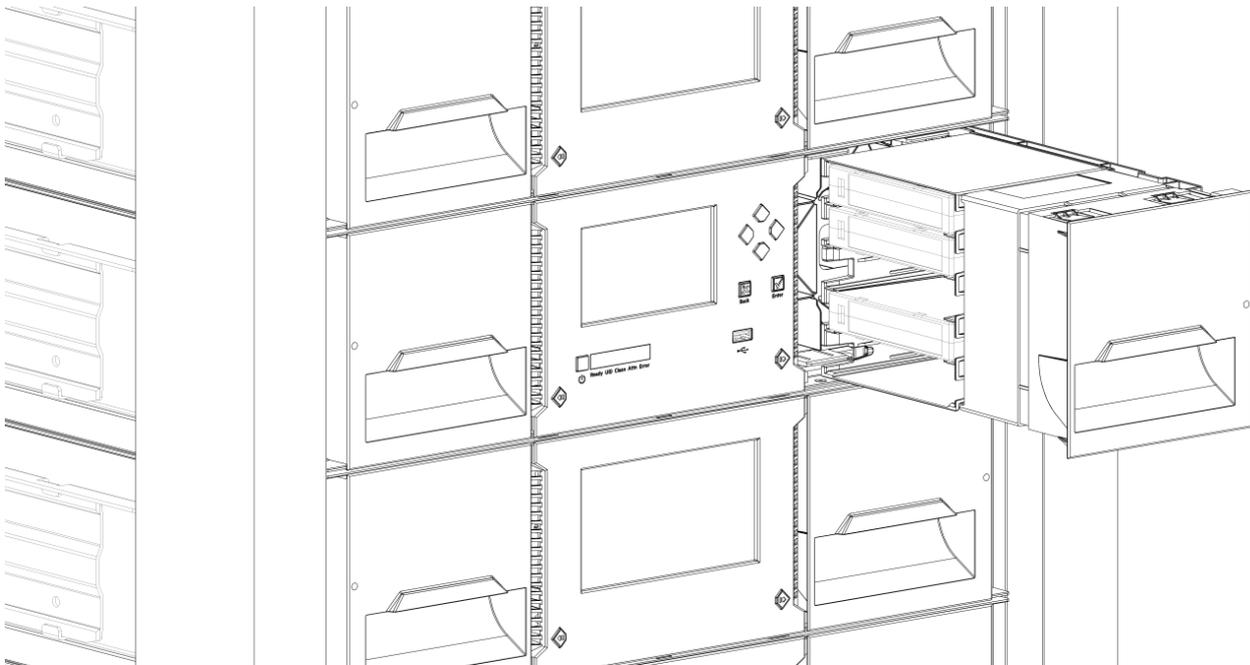
## NOTE

- The mailslot is attached to the magazine and cannot be removed completely
- The mailslot will relock after 30 seconds.



## IMPORTANT

- You can enable mailslots only through the Configuration > Mailslots page on RMI. Enabling the mailslots through the OCP is not possible.
- Wait before pulling out the mailslot until the LED is quickly flashing and OCP message says that the mailslot is unlocked



# COMBACK ARION 3U Library Installation Guide

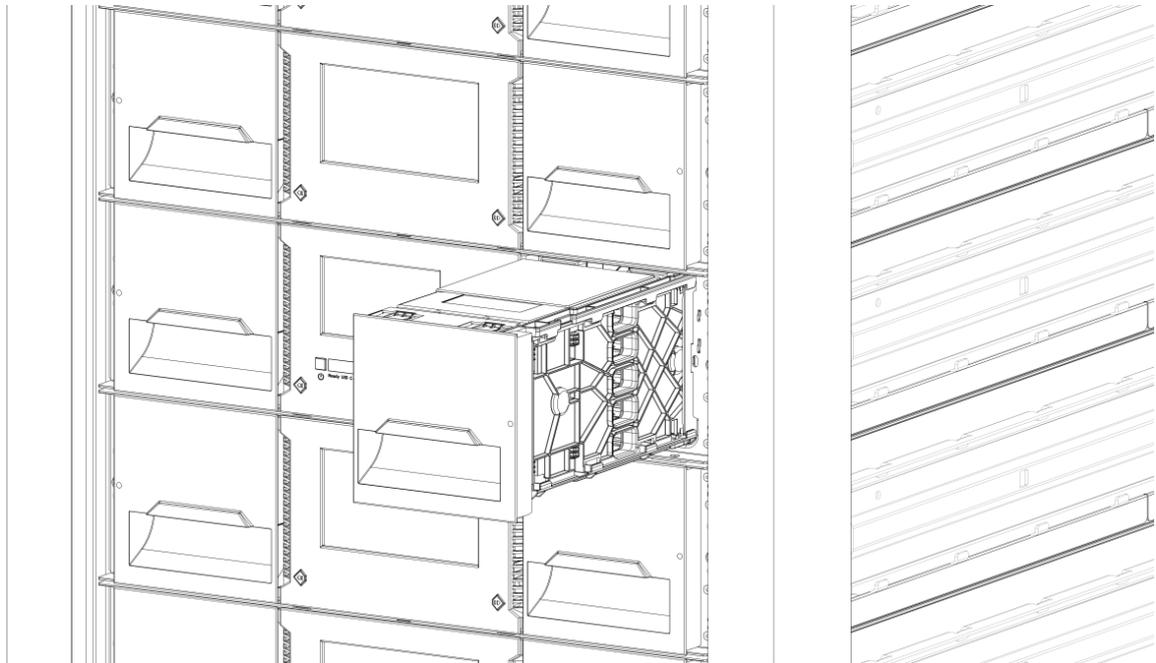


COMBACK ARION

3.0

02/06/2023

Page: 42 of 49



## 4.20.3 Bulk Loading Magazines

1. Press the button for more than 3 seconds. This will start the unlock operation for the magazine, indicated by the LED slowly flashing.
2. When the magazine is unlocked the LED starts quickly flashing
3. Pull out the magazine from the library. As soon as the magazine is pulled out, the LED switches OFF.



### NOTE

- Opening a magazine will take the library off-line.
- The magazines will relock after 30 seconds.



### IMPORTANT

Wait before pulling out the magazine until the LED is quickly flashing and OCP message says that the magazine is unlocked

# COMBACK ARION 3U Library Installation Guide

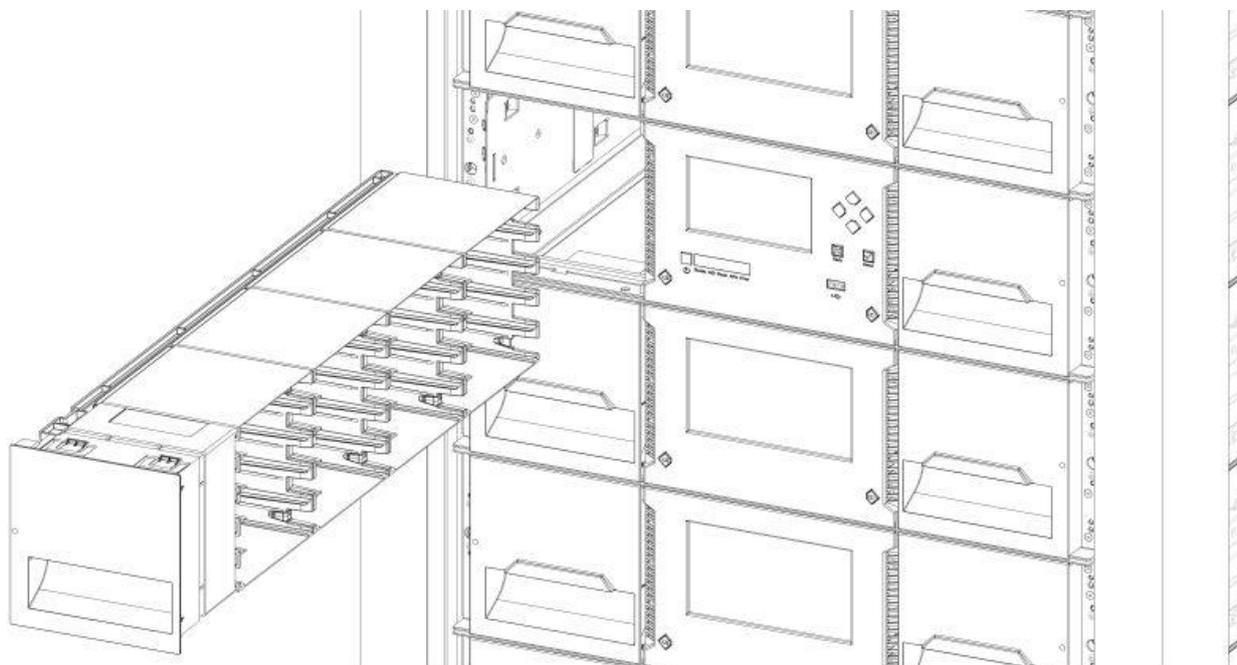


COMBACK ARION

3.0

02/06/2023

Page: 43 of 49



4. Load the tape cartridges into the magazine
5. Insert the magazine to the unit
6. Push the magazine handle slowly until the magazine release latch snaps into place. The magazine locks into place.
7. Repeat steps 1 through 3 for each of the other magazines.



**IMPORTANT**

Push the magazine fully into place until the latch snaps into place.

## 4.21. Verifying the Installation

Verify that the library has the current firmware revision. The library firmware revision is displayed in the top left corner on the RMI screen or on the **Home > Status > Library > Library Status** screen on the OCP.

If necessary, update the library firmware from the OCP or RMI **Maintenance > Software Upgrades > System Firmware** screen.

After configuring the library, you can save the configuration settings to a USB flash drive from the OCP or to a file on your computer from the RMI **Configuration > Save/Restore** screen. Having a backup of the library configuration is helpful when recovering from a configuration error or if the library needs service.

## 4.22. Configuring Additional Features

The library has many features to customize it for your organization.

- Enabling the mailslot. See **“Enabling or Disabling Mailslots”**.
- Naming the library via the partitioning wizard. See **“Configuring Library Partitions”**.
- Partitioning the library. See **“Configuring Library Partitions”**.
- Enabling and configuring SNMP network management. See **“Configuring SNMP”**.
- Setting up email event notification. See **“Configuring Event Notification Parameters”**

## 5 Tape Cartridges and Magazines

This chapter explains which media to use with your library, and how to label and write-protect your tape cartridges. Careful labeling and handling of the tape cartridges will prolong the life of the tape cartridges and the library.

### 5.1. Tape Cartridges

Use the Ultrium data and cleaning tape cartridges designed for your model of library.

#### LTO-6 Tape Drive

<i>Cartridge Type</i>
<i>LTO-6 Ultrium 6.25TB* Data Cartridge</i>
<i>LTO-6 Ultrium 6.25TB* WORM Data Cartridge</i>
<i>Ultrium Universal Cleaning Cartridge</i>

#### LTO-7 Tape Drive

<i>Cartridge Type</i>
<i>LTO-7 Ultrium 15TB* Data Cartridge</i>
<i>LTO-7 Ultrium 15TB* WORM Data Cartridge</i>
<i>Ultrium Universal Cleaning Cartridge</i>

#### LTO-8 Tape Drive

<i>Cartridge Type</i>
<i>LTO-8 Ultrium 30TB* Data Cartridge</i>
<i>LTO-8 Ultrium 30TB* WORM Data Cartridge</i>
<i>Ultrium Universal Cleaning Cartridge</i>

#### LTO-9 Tape Drive

<i>Cartridge Type</i>
<i>LTO-9 Ultrium 45TB* Data Cartridge</i>
<i>LTO-9 Ultrium 45TB* WORM Data Cartridge</i>
<i>Ultrium Universal Cleaning Cartridge</i>

\* - with 2.51 Compression factor

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 45 of 49	

### 5.1.1 Using and Maintaining Tape Cartridges

	<b>CAUTION</b>	Do not degauss LTO data cartridges! These data cartridges are pre-recorded with a magnetic servo signal. This signal is required to use the cartridge with the LTO tape drive. Keep magnetically charged objects away from the cartridge.
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To ensure the longest possible life for your data cartridges, follow these guidelines:

- Use only the data cartridges designated for your device.
- Clean the tape drive when the Clean drive LED is illuminated.

	<b>CAUTION</b>	Use only Ultrium Universal cleaning cartridges.
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- Do not drop a cartridge. Excessive shock can damage the internal contents of the cartridge or the cartridge case itself, making the cartridge unusable.
- Do not expose data cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- The operating temperature range for data cartridges is 10 to 35° C. The storage temperature range is -40 to +60° C in a dust-free environment in which relative humidity is always between 20 percent and 80 percent (non-condensing).
- If the data cartridge has been exposed to temperatures outside the specified ranges, stabilize the cartridge at room temperature for the same length of time it was exposed to extreme temperatures or 24 hours, whichever is less.
- Do not place data cartridges near sources of electromagnetic energy or strong magnetic fields such as computer monitors, electric motors, speakers, or X-ray equipment. Exposure to electromagnetic energy or magnetic fields can destroy data and the embedded servo code written on the media by the cartridge manufacturer, which can render the cartridge unusable.
- Place identification labels only in the designated area on the cartridge.

### 5.1.2 Labeling Tape Cartridges

The device contains a bar code reader that reads the tape labels and stores the inventory data in memory. The device then provides the inventory information to the host application, OCP, and RMI. Having a bar code label on each tape cartridge enables the bar code reader to identify the cartridge quickly, thereby speeding up inventory time. Make it a practice to use bar code labels on your tape cartridges.

A proper bar code label includes the media ID in the last two characters of the bar code. The library will not load an incompatible cartridge, based on the barcode media ID, into a tape drive. For example, the library will not load a cartridge labeled as LTO-3 into an LTO-6 tape drive. This saves the time needed to load the cartridge and have the tape drive reject it.

Your host software may need to keep track of the following information via the associated bar code:

- Date of format or initialization
- Tape's media pool
- Data residing on the tape
- Age of the backup
- Errors encountered while using the tape (to determine if the tape is faulty)

# COMBACK ARION 3U Library Installation Guide



COMBACK ARION

3.0

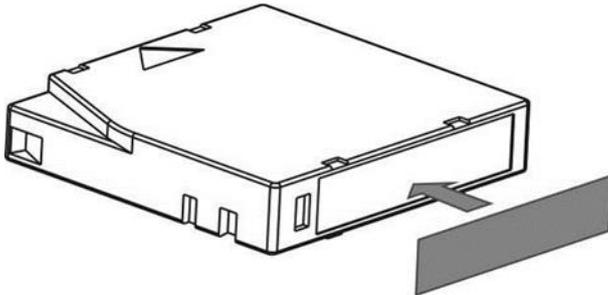
02/06/2023

Page: 46 of 49

**! IMPORTANT**

Misusing and misunderstanding bar code technology can result in backup and restore failures. Use only high quality labels. Self-printed labels are not recommended as they are often a source of barcode reading issues.

LTO tape cartridges have a recessed area located on the face of the cartridge next to the write-protect switch. Use this area for attaching the adhesive-backed bar code label. Only apply labels as shown:



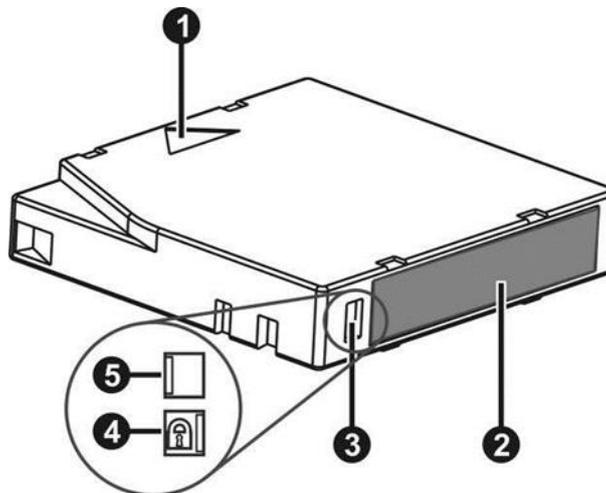
**! IMPORTANT**

The bar code label should only be applied as shown, with the alphanumeric portion facing the hub side of the tape cartridge. Never apply multiple labels onto a cartridge because extra labels can cause the cartridge to jam in a tape drive.

### 5.1.3 Write Protecting Tape Cartridges

All rewriteable data cartridges have a write-protect switch to prevent accidental erasure or overwriting of data. Before loading a cartridge into the device, make sure the write-protect switch on the front of the cartridge is in the desired position.

- Slide the switch to the left to allow the device to write data to the cartridge.
- Slide the switch to the right to write-protect the cartridge. An indicator, such as a red mark or small padlock, is visible showing that the cartridge is write-protected.



1	Insertion Arrow
2	Barcode Label
3	Write-Protect Switch
4	Write-Protected

5	Write-Enabled
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## 5.1.4 Read and Write Compatibility

### *Ultrium Read/Write Compatibility*

	LTO-4 Drive	LTO-5 Drive	LTO-6 Drive	LTO-7 Drive	LTO-8 Drive	LTO-9 Drive
<i>LTO-4 Media, Unencrypted</i>	<i>Read/Write</i>	<i>Read/Write</i>	<i>Read Only</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>
<i>LTO-4 Media, Encrypted</i>	<i>Read/Write with encryption key</i>	<i>Read/Write with encryption key</i>	<i>Read/only with encryption key</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>
<i>LTO-5 Media, Unencrypted</i>	<i>Incompatible</i>	<i>Read/Write</i>	<i>Read/Write</i>	<i>Read Only</i>	<i>Incompatible</i>	<i>Incompatible</i>
<i>LTO-5 Media, Encrypted</i>	<i>Incompatible</i>	<i>Read/Write with encryption key</i>	<i>Read/Write with encryption key</i>	<i>Read/only with encryption key</i>	<i>Incompatible</i>	<i>Incompatible</i>
<i>LTO-6 Media, Unencrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write</i>	<i>Read/Write</i>	<i>Incompatible</i>	<i>Incompatible</i>
<i>LTO-6 Media, Encrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write with encryption key</i>	<i>Read/Write with encryption key</i>	<i>Incompatible</i>	<i>Incompatible</i>
<i>LTO-7 Media, Unencrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write</i>	<i>Read/Write</i>	<i>Incompatible</i>
<i>LTO-7 Media, Encrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write with encryption key</i>	<i>Read/Write with encryption key</i>	<i>Incompatible</i>
<i>LTO-8 Media, Unencrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write</i>	<i>Read/Write</i>
<i>LTO-8 Media, Encrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write with encryption key</i>	<i>Read/Write with encryption key</i>
<i>LTO-9 Media, Unencrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write</i>
<i>LTO-9 Media, Encrypted</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Incompatible</i>	<i>Read/Write with encryption key</i>

**Note:** All listed media are incompatible to LTO1 and LTO2 drives

## 6 Initial Setup of the Library

The library provides two main interfaces:

- Operator Control Panel (OCP) — With the OCP, you can monitor, configure, and control the library from the front panel.
- Remote Management Interface (RMI) — With the RMI, you can monitor, configure, and control the library from a web browser. The RMI hosts a dedicated, protected Internet site that displays a graphical representation of the library.

### Status Icons

	The green Status OK icon indicates that the library is fully operational and that no user interaction is required
	The blue exclamation point Status Warning icon indicates that user attention is necessary, but

		<b>COMBACK ARION 3U Library Installation Guide</b>		
COMBACK ARION	<b>3.0</b>	02/06/2023	Page: 48 of 49	

	that the device can still perform most operations.
	The red X Status Error icon indicates that user intervention is required and that the device is not capable of performing some operations.

## 6.1. Using the OCP

The OCP has a power button, an LCD display, six navigation buttons, and five LEDs. With the OCP you can monitor, configure, and operate most library functions from the library front panel. To navigate the OCP, use the six navigation buttons (up/down, left/right, Enter, Back).

### Front Panel LED Indicators

<i>Unit ID</i>	<i>Blue when activated. The unit identification (UID) LEDs are controlled by the user through the RMI Maintenance &gt; UID LED Control screen. The UIDs on the OCP and base module back panel are activated and deactivated together. In addition UIDs on drives and expansion module back panels can be activated separately. The UIDs are helpful for locating components of the library in a data center.</i>
<i>Ready</i>	<i>Green, steady when power is on, blinking with tape Ready drive or library robotic activity</i>
<i>Clean</i>	<i>Amber when a tape drive cleaning operation is recommended.</i>
<i>Attention</i>	<i>Amber blinking if the library has detected a condition for which user attention is necessary, but that the library can still perform most operations.</i>
<i>Error</i>	<i>Amber if an unrecoverable tape drive or library error occurs. A corresponding error message is displayed on the LCD screen. User intervention is required; the library is not capable of performing some operations.</i>

## 6.2. Using the RMI

With the RMI, you can monitor, configure, and operate most library functions from a web browser.

When possible, it is recommended that the RMI be used as the primary library interface because the web interface provides access to additional features, includes online help, and is easier to use. However, the RMI is not required to use the product, except to configure advanced features, such as SNMP, IPv6, encryption, and partitions.

Before using the RMI, you must configure the library network settings with the OCP. This can be done with the Initial Configuration Wizard. See “**Using the Initial Configuration Wizard**”.

To start the RMI, open the latest version of a supported HTML browser and enter the IP address of the library in the browser’s address bar. Supported browsers include Internet Explorer, Firefox, Chrome and Safari.

	<b>TIP</b> Check the online help in the RMI for additional information. The help pages are updated with firmware updates and often contain up-to-date technical details that might not be contained in this document. To access RMI help, click the ? icon on the right side of the RMI top banner.
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## 6.3. Using the Initial Configuration Wizard on the OCP

For initial configuration navigate to the **Home > Configuration > Initial System Setup** feature. The wizard guides you through setting library network configuration, configuring date and time, and setting the administrator PIN. You can skip items and stop the wizard at any time.

	<h2>COMBACK ARION 3U Library Installation Guide</h2>		
COMBACK ARION	3.0	02/06/2023	Page: 49 of 49



**NOTE**

On the very first power up of the library the user is prompted to walk through the Initial Configuration wizard. It is recommended to walk completely through the wizard and finish the wizard by pressing the **Finish Button**. Otherwise with every login on the OCP the user will be prompted again to walk through the wizard.

Once you have configured the network settings, you can initiate the wizard from the RMI to complete the remaining configurations.

To login the very first time on the RMI you should use the default administrator password "adm001". To set your own password go to the page Configuration > User Accounts on the RMI.