

Quantum Scalar i500: Rackmount Kit Installation

All Scalar® i500 libraries taller than 14U must be installed in a rack. The rack secures the bottom module, and all other modules are then secured to the bottom module.

The Rackmount kit secures your library within a rack. These instructions explain how to install your library into a rack, and how to install additional modules into an existing rack.

Installing the modules into the rack requires at least two people.

WARNING: All libraries taller than 14U must be installed in a rack having a main protective earthing (grounding) terminal, and power must be supplied via an industrial plug and socket-outlet and/or an appliance coupler complying with IEC 60309 (or an equivalent national standard) and having a protective earth (ground) conductor with a cross sectional area of at least 1.50 mm² (14 AWG).

To ensure proper airflow and access space, allow 60 cm (24 inches) in the front and back of the library.

WARNING: Under no circumstances should a rack be moved while loaded with one or more modules.



WARNING: Without tape drives, tape cartridges, or power supplies, a control module weighs approximately 60 lbs (27.20 kg). An expansion module, without tape drives, tape cartridges, or power supplies, exceeds 65 lbs (29.50 kg).

To avoid serious injury, at least two people are required to safely lift the modules.

Note: The Rackmount kit cannot be used with every type of rack. Racks with threaded rails or unique hole spacing, for example, may not support the Rackmount kit. In addition, the rack must have rail spacing (front to rear) of between 23.80 in. (605 mm) and 30.30 in. (770 mm).

To install the rackmount, refer to the following sections:

- [Preparing for Installation](#) on page 2
- [Installing the Rackmount Shelves](#) on page 6
- [Preparing Modules for Rack Installation](#) on page 9
- [Installing the Bottom Module in the Rack](#) on page 10
- [Installing Additional Modules Into the Rack](#) on page 13
- [Completing the Installation](#) on page 18

Preparing for Installation

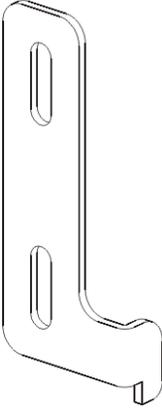
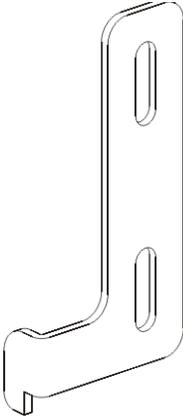
These instructions explain how to prepare the content of the kit for installation.

Required tools: None

- 1 Before beginning installation, verify the contents of the Rackmount kit (see [Table 1](#)) and the Rack Ear kit (see [Table 2](#) on page 4).
 - You only need one Rackmount kit per library. The Rackmount kit allows you to secure the bottom module in the rack. It includes rack ears for additional security.
 - You need one Rack Ear kit for each additional module. Each Rack Ear kit contains the supplies to install right and left rack ears on one module.

Table 1 Rackmount Kit Contents

Component	Description	Quantity
	Small ferrule — Used in racks with round holes	10 (8 required; 2 spares)

Component	Description	Quantity
	Large ferrule — Used in racks with square holes	10 (8 required; 2 spares)
	Thumbnut — Secures the rack shelves to the rack	8
	M5 thumbscrew — Secures the rack ears	4
	Rack ear, left — Holds the modules in the rack	1
	Rack ear, right — Holds the modules in the rack	1

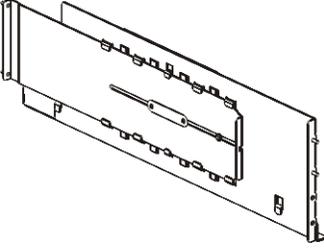
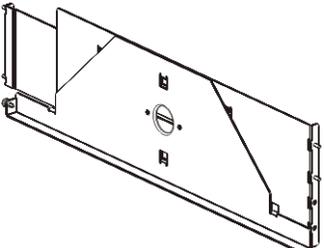
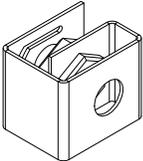
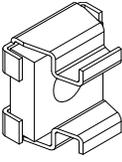
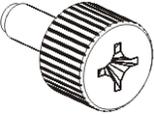
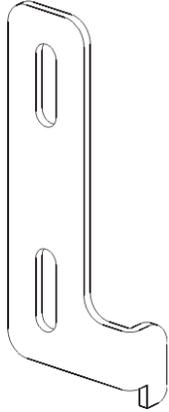
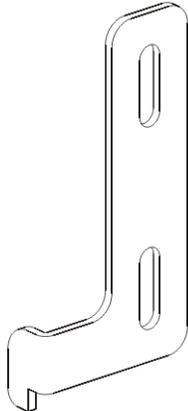
Component	Description	Quantity
	Rack shelf, left — Secures the modules in the rack	1
	Rack shelf, right— Secures the modules in the rack	1

Table 2 Rack Ear Kit Contents

Component	Description	Quantity
	Nut clip — Used in racks with square holes	4
	Cage nut — Used in racks with round holes	4
	M5 thumbscrew — Secures the rack ears	4

Component	Description	Quantity
	Rack ear, left — Holds the modules in the rack	1
	Rack ear, right — Holds the modules in the rack	1

- 2 Remove all rack hardware that may interfere with the installation of the rackmount and the modules that you plan to add to the rack.
- 3 Consider removing the front and back doors of the rack to obtain full access to the mounting holes and other areas of the rack.
- 4 Determine the type of rack in which you plan to install the rackmount. Different racks require different rackmount parts. Although the Rackmount kit contains many parts, the parts you use depend on your rack's mounting holes:
 - If the rack has round mounting holes, use the small ferrules and the nut clips.
 - If the rack has square mounting holes, use the large ferrules and the cage nuts.
 - If the rack has threaded (tapped M6) holes, do not use the ferrules, nut clips, or cage nuts. Determine where in your rack you want to install the rackmount shelves.
 - Consider installing the shelves at a height that puts the base of the control module anywhere between the 28U-32U alignment markers, which is usually a comfortable height for reading the Operator panel.

Remember, the control module can be placed anywhere within the library configuration above, below, or between any expansion modules.

Note: The recommended placement of the control module for 41U library configurations is on top of three 9U expansion modules and below the top expansion module.

Installing the Rackmount Shelves

These instructions explain how to install the rackmount shelves.

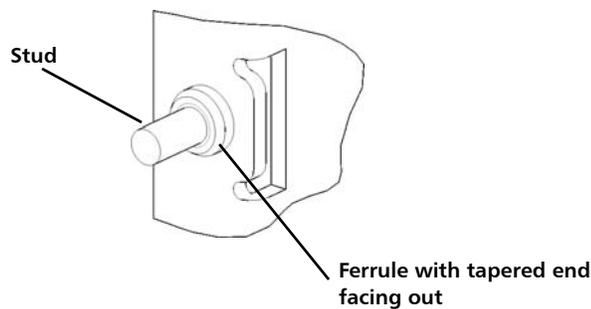
Required parts: Rackmount shelves, (8) ferrules, (8) thumbnuts

- 1 If the rackmount shelves are extended, collapse them to their smallest size. It is easier to fit and position the shelves within the rack when the shelves are compact.

Note: Extending the shelves can be difficult, but they are designed to be resized by hand. Do not use tools to resize the shelves, and never take them apart.

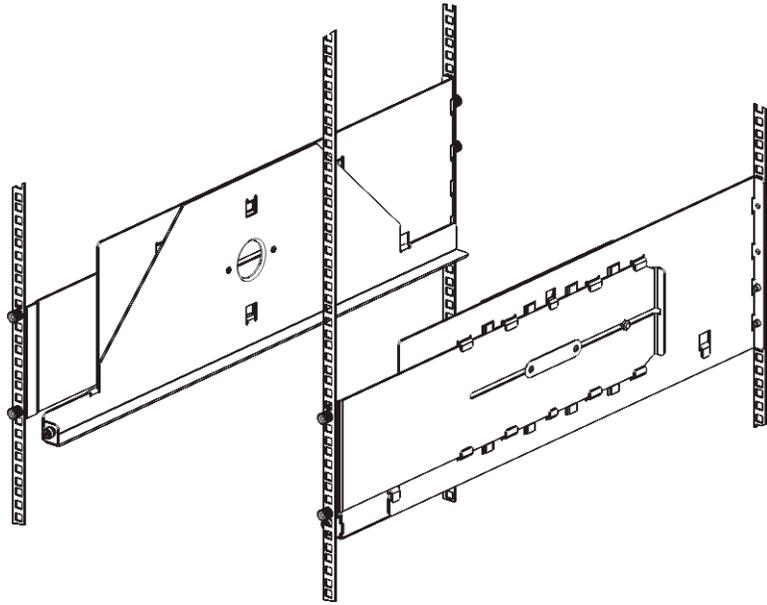
- 2 Place a ferrule on the end of each stud, and screw it on completely. The larger side of the ferrule should face the rack shelf, and the tapered end should face out (see [Figure 1](#)). Be sure to use the proper size ferrule, as described in [Preparing for Installation](#) on page 2.

Figure 1 Ferrule on the End of a Stud



- 3 Install the rackmount shelves into the rack so that they are level with one another:
 - a Install the shelf's rear studs in the rack's rear mounting holes (see [Figure 2](#)).

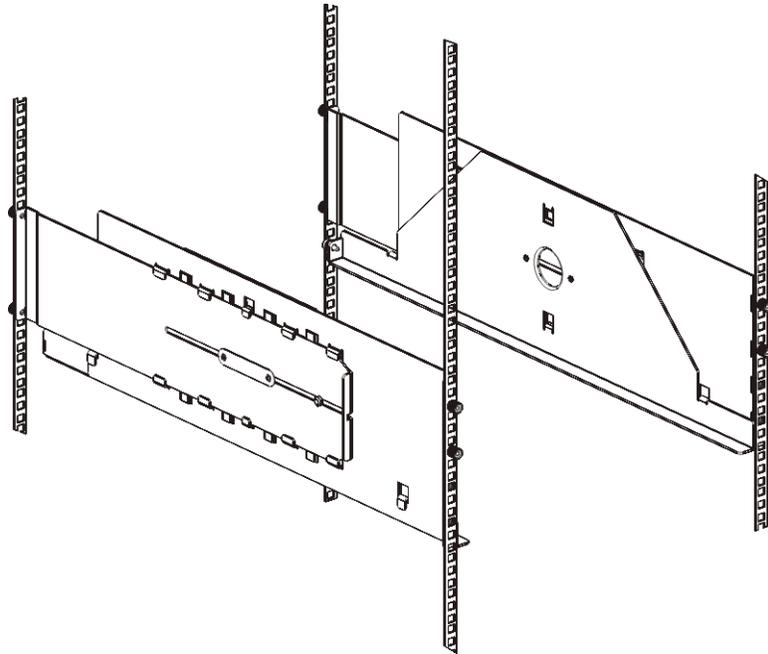
Figure 2 Back of Rails



- b Position the shelf to the appropriate side of the rack (right or left) and align the shelf at the desired height.
- c Insert the shelf's rear studs into the rack's rear mounting holes.
- d Fasten a thumbnut to the end of each stud. Secure the rack tightly, so that the ferrule fits snugly within the hole in the rack.

- e Install the shelf's front studs in the rack's front mounting holes (see [Figure 3](#)).

Figure 3 Front of Rails



- f If the studs do not reach the mounting holes, pull the front of the shelf toward you to extend it to the necessary length. Hold the base of the shelf with one hand, and pull the extensible part of the shelf with your other hand.

Note: Extending the shelves can be difficult, but they are designed to be resized by hand. Do not use tools to resize the shelves, and never take them apart.

- g Insert the shelf's front studs into the rack's front mounting holes.
 - h Fasten a thumbnut to the end of each stud. Secure the rack tightly, so that the ferrule fits snugly within the hole in the rack.
- 4 Visually make sure that both shelves are level, and that they are aligned properly within the rack.
 - 5 Make sure that all thumbnuts are fastened tightly. Some thumbnuts may have loosened during installation.

Preparing Modules for Rack Installation

These instructions explain how to prepare the modules for the installation into the rack.

- 1 Save the library configuration:
 - a From the Web client, select **Tools > Save/Restore Configuration**.
 - b Select **Save System Configuration**, and click **Apply**.
- 2 Power off your library; perform the shutdown sequence and then press the power button on the front of the control module:
 - From the Web client, select **Operations > System Shutdown**.
 - From the Operator panel, select **Operations > Shutdown**.
- 3 Disconnect all power cords, network data cables, and module-to-module cables. Label the cables so that you can reconnect them to the correct ports.
- 4 Remove all tape cartridges, tape drives, power supplies, and all cords and cables, from the library modules. The modules are much easier to lift into the rack without the additional weight of the tape drives. Be sure to label each item so that you can return it to its correct position.

WARNING: Without tape drives, tape cartridges, or power supplies, a control module weighs approximately 60 lbs (27.20 kg). An expansion module, without tape drives, tape cartridges, or power supplies, exceeds 65 lbs (29.50 kg).

To avoid serious injury, at least two people are required to safely lift the modules.

- 5 Park the robot assembly in the control module:

Note: Regardless of which module you are installing, the robot must be parked in the control module before you begin moving the modules into the rack.

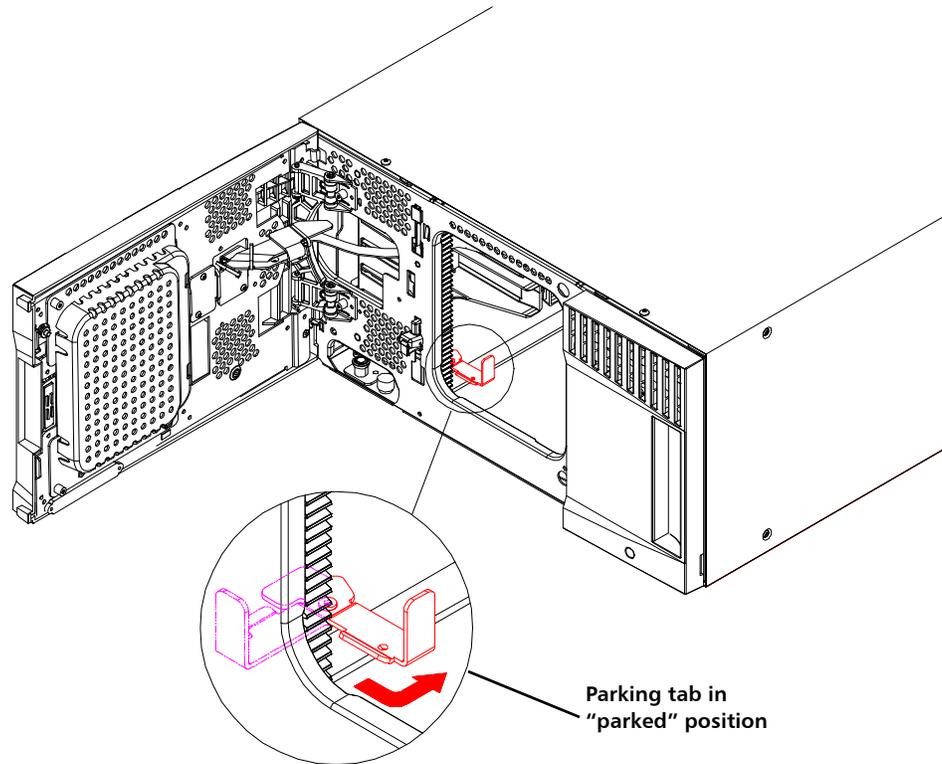
- a Open the I/O station and access doors of each module.
- b Using your hands, gently lift the robot assembly into the control module. The robot assembly should glide slowly and with some resistance.

Caution: Support the robot assembly by holding onto the broad metal X-axis plate. Lifting the robot by the thin metal rod will bend the rod. Lifting the robot by the black plastic picker body can damage the robot.

- c After raising the robot assembly to the approximate middle of the control module, hold it in place with one hand and, using your other hand, move the parking tab in a counter-clockwise direction until it stops in the "parked" position (see [Figure 4](#) on page 10). The metal parking tab is located at the bottom of column 1.

- d Gently lower the robot assembly to rest on the parking tab.

Figure 4 Parking Tab



Installing the Bottom Module in the Rack

These instructions explain how to install the bottom module into the rack.

Required parts: Rack ears, (4) M5 thumbscrews, (4) nut clips or (4) cage nuts

Explanation of parts: Each rack ear contains two elongated holes, enabling you to fasten it to the rack (using the M5 thumbscrews and either the nut clips or cage nuts), using the most accessible mounting holes.

- 1 Place the desired module (whichever module you want to be the bottom module of the library) onto the rackmount shelves. From the front of the rack, lift the module onto the shelf and gently slide it into the rack. Slide the module to the back of the rack, so that the front of the module is flush with the mounting holes.
- 2 From the back of the rack, secure the module to the rackmount shelves by tightening the two silver thumbscrews that are attached to the rear of the rackmount shelves.
- 3 Determine where in the rack to install the nut clips (or cage nuts).

Note: Consider using the following method to determine where to install the nut clips (or cage nuts), rather than adding the module to the rack first. If you add the module to the rack first, installing the nut clips (or cage nuts) can be difficult, because rack space has become restricted.

- 4 Install the nut clips (or cage nuts) to the desired location in the rack.

Installing nut clips:

- a Hold the nut clip so that its semi-circle design faces outside the rack.
- b Push the nut clip onto the rack's mounting holes so that the nut is behind the rack's holes. (After the nut clip is installed, you can slide it up and down the mounting holes, if necessary.)

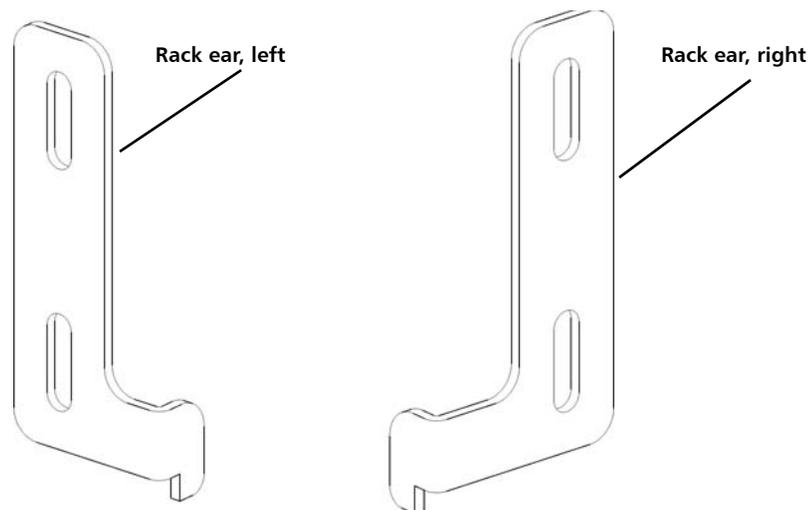
Installing cage nuts:

- a Hold the cage nut so that its hinges face outside the rack, and so that its hinges clasp the upper and lower portions of the square hole.
- b Place the cage nut in the desired hole. Insert one hinge in the hole first, then pinch the cage nut and push it into the hole until it snaps into place. (You may want to use a screwdriver to help push the hinge into the hole.)

- 5 Install the right rack ear (see [Figure 5](#)). At the front of the library:

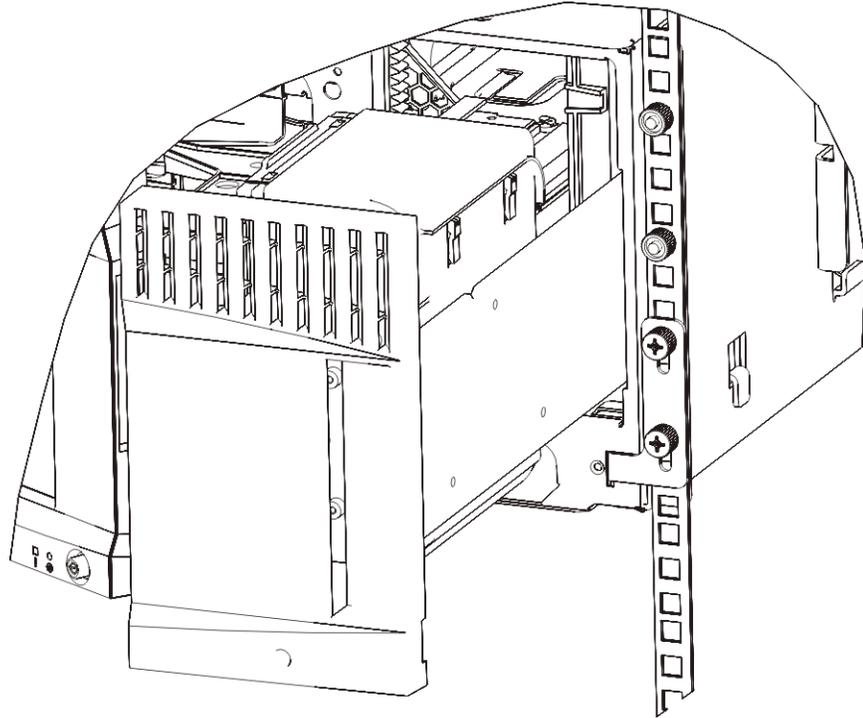
- a Open the I/O station door. At the lower right corner of the module is a vertical slot. Insert the hinge of the right rack ear into the slot, and then position the holes of the rack ear flush with the rack rail.

Figure 5 Rack Ear Hinges



- b Using two M5 thumbscrews, fasten the rack ear to the rack. The thumbscrews should thread through the nut clips (or cage nuts) and fasten completely and evenly (see [Figure 6](#) on page 12).

Figure 6 Right Rack Ear Hinge Attached to Rack



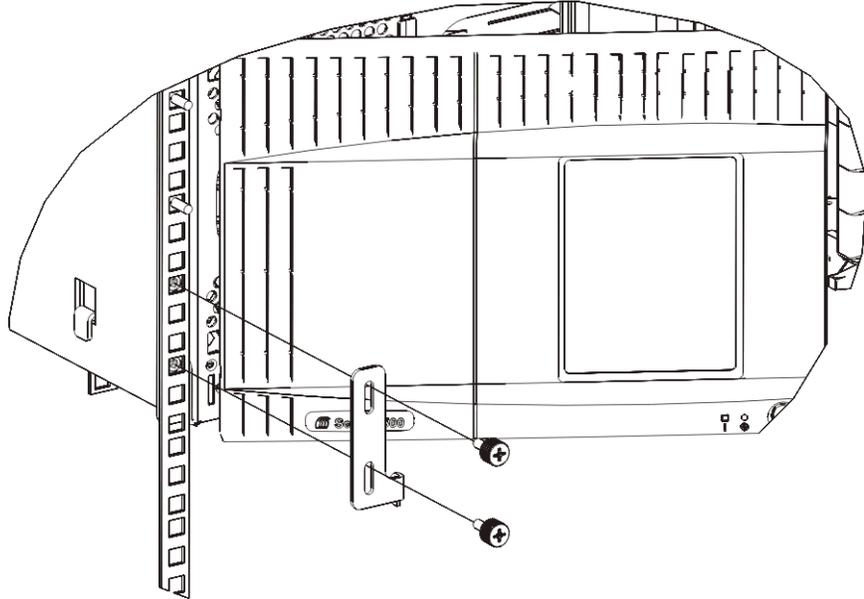
6 Install the left rack ear:

- a With the I/O station door open, open the left door (the access door) of the module and pull the door toward you to access the slot located in the lower left corner of the module. (The flexible door hinge allows the door to be pulled away from the module, providing access to the slot.)

Note: You may need to pull the door toward you to access the slot.

- b Install the left rack ear in the same manner as the right rack ear.
- c Using two M5 thumbscrews, fasten the rack ear to the rack. The thumbscrews should thread through the nut clips (or cage nuts) and fasten completely and evenly (see [Figure 7](#) on page 13).

Figure 7 Attaching Left Rack
Ear Hinge to Rack



- 7 If you are installing only the control module, complete its installation by following the instructions in [Completing the Installation](#) on page 18.

Installing Additional Modules Into the Rack

All modules that you add to the rack must be positioned above the module that you previously installed, since the bottom module must be secured to the rackmount shelves (unless you decide to uninstall the entire library from the rack and reconfigure it).

These instructions explain how to add and position modules into the rack.

Required parts: Rack ears, (4) M5 thumbscrews, (4) nut clips or (4) cage nuts

Explanation of parts: Each rack ear contains two elongated holes, enabling you to fasten it to the rack (using the M5 thumbscrews and either the nut clips or cage nuts), using the most accessible mounting holes.

- 1 Remove the covers, as needed:
 - If you are installing a module above a module that currently has a top cover, remove the top cover by unscrewing the screws holding the top to the module.
 - If the module you are installing has a bottom cover, remove the bottom cover by unscrewing the screws holding the bottom to the module.

The module is now ready to be installed above another module in the rack. You need to make sure the library is “hollow” all the way through, with just one bottom cover on the lowest module and one top cover on the top

module. See the section “Installing the New 9U Expansion Module” in the *Scalar i500 User’s Guide*.

2 Determine where in the rack to install the nut clips (or cage nuts).

Note: Consider using the following method to determine where to install the nut clips (or cage nuts), rather than adding the module to the rack first. If you add the module to the rack first, installing the nut clips (or cage nuts) can be difficult, because rack space has become restricted.

- If you are adding a module above a previously racked expansion module, count 9 full units from the location of the expansion module’s rack ears, and prepare to install the nut clip (or cage nut) to that location on the rack.

For example, if the expansion module’s rack ears are located at 1U and 2U, then the nut clips (or cage nuts) should be installed at 10U and 11U.

Next, determine which holes you must use within the 10U and 11U markers. Notice that each rack unit (U), as delineated by the alignment markers in the rack, contains 3 mounting holes.

- If you are adding a module anywhere above the control module, position the nut clip (or cage nut) at the middle hole in that unit. If you are adding a module anywhere below the control module, position the nut clip (or cage nut) at the upper hole in that unit.
- If you are adding a module directly above a previously racked **control module**, count 5 full units from the location of the control module’s rack ears, and prepare to install the nut clip (or cage nut) to that location on the rack.

For example, if the control module’s rack ears are located at 1U and 2U, the nut clips (or cage nuts) should be installed at 6U and 7U.

3 Determine which holes you must use within the 6U and 7U markers. Notice that each rack unit, as delineated by the alignment markers in the rack, contains 3 mounting holes.

- If you are adding a module anywhere above the control module, position the nut clip (or cage nut) at the middle hole in that unit.
- If you are adding a module anywhere below the control module, position the nut clip (or cage nut) at the upper hole in that unit.

4 Install the nut clips (or cage nuts) to the desired location in the rack.

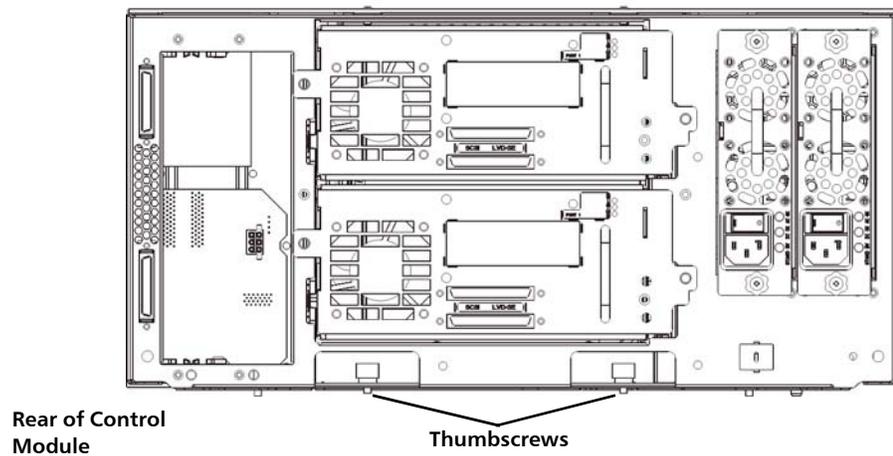
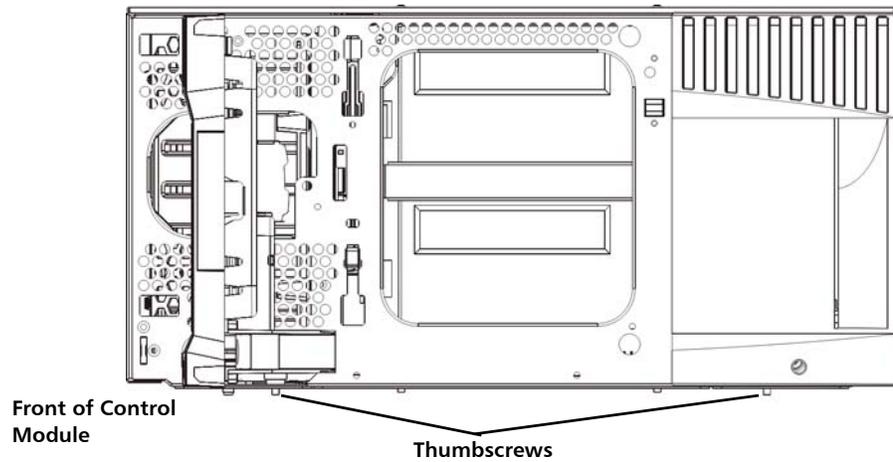
Installing nut clips:

- a Hold the nut clip so that its semi-circle design faces outside the rack.
- b Push the nut clip onto the rack’s mounting holes so that the nut is behind the rack’s holes. (After the nut clip is installed, you can slide it up and down the mounting holes, if necessary.)

Installing cage nuts:

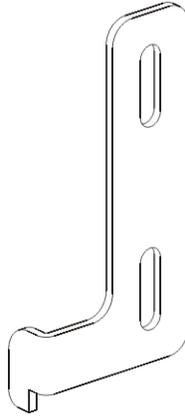
- a Hold the cage nut so that its hinges face outside the rack, and so that its hinges clasp the upper and lower portions of the square hole.

Figure 9 Thumbscrew Location in Module



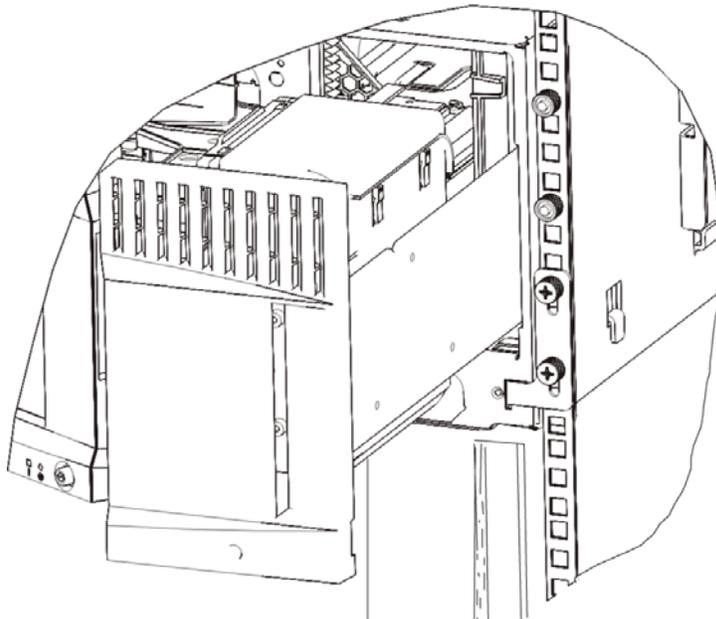
- 9 Install the right rack ear (see [Figure 10](#) on page 17). At the front of the library:
 - a Open the I/O station door. At the lower right corner of the module is a vertical slot. Insert the hinge of the right rack ear into the slot and then position the holes of the rack ear flush with the rack rail.

Figure 10 Right Rack Ear Hinge



- b Using two M5 thumbscrews, fasten the rack ear to the rack. The thumbscrews should thread through the nut clips (or cage nuts) and fasten completely and evenly (see [Figure 11](#)).

Figure 11 Rack Hinges on the Top Right of Module



10 Install the left rack ear:

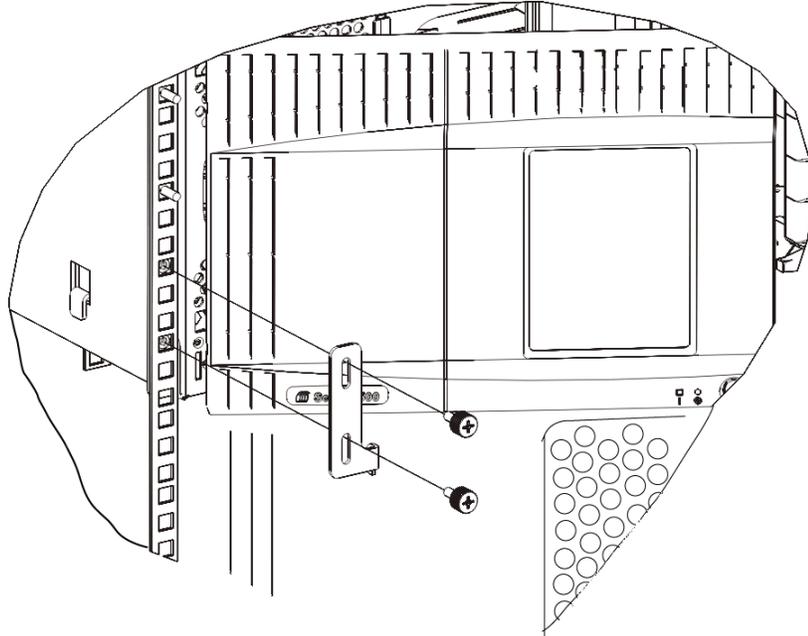
- a With the I/O station door open, open the left door (the access door) of the module and pull the door toward you in order to access the slot located in the lower left corner of the module. (The flexible door hinge allows the door to be pulled away from the module, providing access to the slot.)

Note: You may need to pull the door toward you in order to access the slot.

- b Install the left rack ear in the same manner as the right rack ear.

- c Using two M5 thumbscrews, fasten the rack ear to the rack. The thumbscrews should thread through the nut clips (or cage nuts) and fasten completely and evenly (see [Figure 12](#)).

Figure 12 Rack Hinges on the Top Left of Module



- 11 Close the module's doors.
- 12 Do one of the following:
 - If you are adding an additional module, repeat these steps, starting at [Step 1](#) on page 13.
 - If you have completed installing all your modules, complete the installation by following the instructions in [Completing the Installation](#) on page 18.

Completing the Installation

These instructions explain how to complete the installation and power on your library.

- 1 Unpark the robot assembly in the control unit:
 - a Gently raise the robot assembly so that it no longer rests on the parking tab.

