

# SCALAR 1000

## Product Reference Guide



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For more product information about the Scalar 1000, please refer to the Scalar 1000's Operator Guide.

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Document Number: 62-0130-01, Rev A  
Published: February 1999

Printed in the USA

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## Company Introduction

Since its founding in 1983, ADIC™ (Advanced Digital Information Corporation) has specialized in providing backup and archival tape storage products for high value data. Today, it is the leading technology-independent supplier of automated tape libraries for networked systems.

Throughout its history, ADIC has remained committed to providing its customers access to the most advanced tape storage technology available, no matter where it is developed. Its product line includes automated tape storage systems for the latest 4mm (DAT), 8mm, AIT and DLT™ technologies, and is supported by all leading storage management software products for every leading operating system.

ADIC's entire business plan rests on a commitment to protect critical data by continually advancing the art of automated storage. ADIC offers a world-wide network of knowledgeable, service-oriented resellers with local support throughout North America, Europe, and the Pacific Rim. A strong technical service organization, including a 24-hour response line, will answer your questions. Combined, ADIC's strong product offerings and technical innovations create the right solution for its customers.

The Scalar 1000, ADIC's newest member to its growing Scalar family, offers the ultimate scalability with an impressive tape slot capacity, a proven feature set, high reliability, and true flexibility. This robust product rounds out the Scalar family as the premier high-end, tape backup solution.

## Product Overview

The Scalar 1000 solves cost and capacity problems by providing a high performance tape storage system that can cost-effectively grow with changing data storage needs.

By adding modular cabinets and extending its robotic mechanism along one continuous x-axis, its seamless growth path minimizes the Total Cost of Ownership (TCO).

The Scalar 1000's modular expansion architecture is less expensive and performs faster because it utilizes only one robotic system. This design eliminates the need to pass cartridges through multiple robotics and pass-through ports. In addition, the Scalar 1000's minimized moving parts and lack of alignment problems

make it extremely reliable. Another aspect of the library's flexibility is its ability to support multiple drive technologies, including DLT, AIT and IBM 3590 technologies. These drives ensure industry-leading transfer speed, capacity and reliability.



### Streamlined Growth

Physically growing the size of a Scalar 1000 library is straightforward and cost-effective. With a maximum configuration of four modules, it consists of one control module and up to three expansion modules.

The bottom rail (known as the x-axis), is extended as each module is added. No pass-through ports are needed since there is no wall between modules. As a result, the picker simply moves along the newly-extended axis. The associated cabling is also changed to allow the picker mechanism to move between the modules. As a result of this efficient design, *no pass-through ports are required.*

After connecting another module, the Scalar 1000 self-tests for the new, larger library configuration upon its first power up. Growth is simplified even more since no new firmware is required as modules are added. Drive bay capacity is field upgradable, allowing existing customers to easily add more drives as needed.

## Control Module

Control modules contain the same hardware functionality and associated performance specifications. The control modules differ in tape capacity, drive bay configurations and mailbox capacity.

- Library control hardware
- Cartridge accessor
- Robotic mechanism
- Operator LCD-display panel
- Insert/eject mailbox
  - DLT: 12 slots
  - AIT: 18 slots
  - 3590: 12 slots
- Flexible tape drive & cartridge slot configurations:
  - DLT
    - 6 drive bays and 158 cartridge slots
    - 12 drive bays and 118 cartridge slots
  - AIT
    - 12 drive bays and 237 cartridge slots
  - 3590
    - 2 drive bays and 158 cartridge slots
    - 4 drive bays and 118 cartridge slots

## Expansion Modules

To increase tape and drive capacity, simply add more expansion modules (up to three) to the control module.

Expansion modules contain a variety of tape drives and cartridge storage configurations, depending on the drive technology it supports.

- DLT
  - 0 drive bays and 210 cartridge slots
  - 6 drive bays and 170 cartridge slots
  - 12 drive bays and 130 cartridge slots
- AIT
  - 0 drive bays and 315 cartridge slots
  - 12 drive bays and 255 cartridge slots
- 3590
  - 0 drive bays and 210 cartridge slots
  - 2 drive bays and 170 cartridge slots
  - 4 drive bays and 130 cartridge slots

The Scalar 1000 can be configured to support up to 48 tape drives at maximum capacity. Broken down, each module can contain up to 12 tape drives utilizing either DLT or AIT technology; 3590 configurations contain up to 4 drives per module. Drive module density varies by model as well. For example, the AIT drive modules are offered in pairs while DLT and 3590 modules are added in increments of one.

### Scalar 1000 / DLT



#### DLT

- Up to 48 DLT drives
- Up to 788 DLT cartridge slots
- 12-slot import/export mailbox
- Up to 63 TB<sup>1</sup> storage capacity

### Scalar 1000 / AIT



#### AIT

- Up to 48 AIT drives (offered in pairs)
- Up to 1,182 AIT cartridge slots
- 18-slot import/export mailbox
- Up to 118 TB<sup>1</sup> storage capacity

### Scalar 1000 / 3590



#### 3590

- Up to 16 3590 drives
- Up to 788 3590 cartridge slots
- 12-slot import/export mailbox
- Up to 24 TB<sup>2</sup> storage capacity

<sup>1</sup> with 2:1 compression

<sup>2</sup> with 3:1 compression

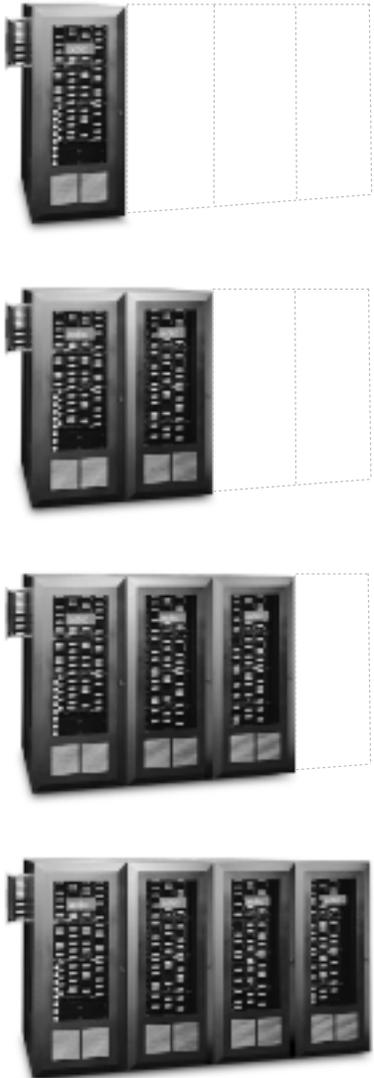
## DLT Capacity Guidelines

### BUILDING BLOCKS OF A SCALAR 1000 / DLT LIBRARY

The Scalar 1000 / DLT control module, which can also serve as a self-contained library, is configured with 6 or 12 DLT drive bays. Each expansion module is configured for tape storage only (no drive bays), with 6 drive bays, or with 12 drive bays.

Choice of drive bay configuration determines the tape positions available in each module (see table). Drives to populate drive bays are ordered separately and may be easily added on-site. Configuration change is easy since the drive bay and cartridge capacity of any module can be easily reconfigured in the field. The Scalar 1000 automatically “reteaches” the library’s settings to reflect new configurations.

Scalar 1000 / DLT



<i>Scalar 1000 / DLT</i>		
	Drive Bays	Cartridge Capacity
Control Module	6	158
	12	118
Expansion Module	0	210
	6	170
	12	130

Library Configuration	Drive Count	DLT Cartridge Capacity	DLT7000 Storage Capacity <sup>1</sup>	DLT8000 Storage Capacity <sup>1</sup>
Control Module	1 - 6	158	11.1TB	12.6TB
	7 - 12	118	8.3TB	9.4TB
Control Module and 1 Expansion Module	1 - 6	368	26.8TB	29.4TB
	7 - 12	328	23.0TB	26.2TB
	13 - 18	288	20.2TB	23.0TB
	19 - 24	248	17.4TB	19.8TB
Control Module and 2 Expansion Modules	1 - 6	578	40.5TB	46.2TB
	7 - 12	538	37.7TB	43.0TB
	13 - 18	498	34.9TB	39.8TB
	19 - 24	458	32.1TB	36.6TB
	25 - 30	418	29.3TB	33.4TB
	31 - 36	378	26.5TB	30.2TB
Control Module and 3 Expansion Modules	1 - 6	788	55.2TB	63.0TB
	7 - 12	748	52.4TB	59.8TB
	13 - 18	708	49.6TB	56.6TB
	19 - 24	668	46.8TB	53.4TB
	25 - 30	628	44.0TB	50.2TB
	31 - 36	588	41.2TB	47.0TB
	37 - 42	548	38.4TB	43.8TB
	43 - 48	508	35.6TB	40.6TB

<sup>1</sup> With 2:1 compression.

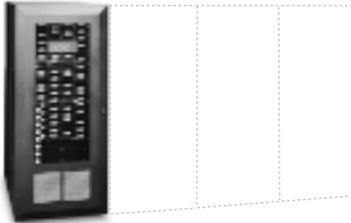


## AIT Capacity Guidelines

### BUILDING BLOCKS OF A SCALAR 1000 / AIT LIBRARY

The Scalar 1000 / AIT control module, which can also serve as a self-contained library, is configured with 12 AIT drive bays. Each expansion module is configured for tape storage only (no drive bays), or with 12 drive bays.

Choice of drive bay configuration determines the tape positions available in each module (see table). Drives to populate drive bays are ordered separately and may be easily added on-site. Configuration change is easy since the drive bay and cartridge capacity of any module can be easily reconfigured in the field. The Scalar 1000 automatically “reteaches” the library’s settings to reflect new configurations.



### Scalar 1000 / AIT

	Drive Bays	Cartridge Capacity
Control Module	12	237
Expansion Module	0	315
	12	255

Library Configuration	Drive Count <sup>1</sup>	Cartridge Capacity	AIT1 Storage Capacity <sup>2</sup>	AIT2 Storage Capacity <sup>3</sup>
Control Module	2 - 12	237	16.6TB	23.7TB
Control Module and 1 Expansion Module	2 - 12	552	38.6TB	55.2TB
	14 - 24	492	34.4TB	49.2TB
Control Module and 2 Expansion Modules	2 - 12	867	60.7TB	86.7TB
	14 - 24	807	56.5TB	80.7TB
	26 - 36	747	52.3TB	74.7TB
Control Module and 3 Expansion Modules	2 - 12	1182	82.7TB	118.2TB
	14 - 24	1122	78.5TB	112.2TB
	26 - 36	1062	74.3TB	106.2TB
	38 - 48	1002	70.1TB	100.2TB

<sup>1</sup> AIT drives offered in pairs.

<sup>2</sup> With 2:1 compression. Capacities specified use 230m media. For 170m media reduce capacity by 28.6%.

<sup>3</sup> With 2:1 compression.

## 3590 Capacity Guidelines

### BUILDING BLOCKS OF A SCALAR 1000 / 3590 LIBRARY

The Scalar 1000 / 3590 control module, which can also serve as a self-contained library, is configured with 2 or 4 3590 drive bays. Each expansion module is configured for tape storage only (no drive bays), with 2 drive bays, or with 4 drive bays.

Choice of drive bay configuration determines the tape positions available in each module (see table). Drives to populate drive bays are ordered separately and may be easily added on-site. Configuration change is easy since the drive bay and cartridge capacity of any module can be easily reconfigured in the field. The Scalar 1000 automatically “reteaches” the library’s settings to reflect new configurations.

Scalar 1000 / 3590



<i>Scalar 1000 / 3590</i>	Drive Bays	Cartridge Capacity
Control Module	2	158
	4	118
Expansion Module	0	210
	2	170
	4	130

Library Configuration	Drive Count	Cartridge Capacity	Storage Capacity <sup>1</sup>
Control Module	1 - 2	158	4.7TB
	3 - 4	118	3.5TB
Control Module and 1 Expansion Module	1 - 2	368	11.0TB
	3 - 4	328	9.8TB
	5 - 6	288	8.6TB
	7 - 8	248	7.4TB
Control Module and 2 Expansion Modules	1 - 2	578	17.3TB
	3 - 4	538	16.1TB
	5 - 6	498	14.9TB
	7 - 8	458	13.7TB
	9 - 10	418	12.5TB
	11 - 12	378	11.3TB
Control Module and 3 Expansion Modules	1 - 2	788	23.6TB
	3 - 4	748	22.4TB
	5 - 6	708	21.2TB
	7 - 8	668	20.0TB
	9 - 10	628	18.8TB
	11 - 12	588	17.6TB
	13 - 14	548	16.4TB
	15 - 16	508	15.2TB

<sup>1</sup> with 3:1 compression per IBM guidelines.



## Key Features

The Scalar 1000 library offers a robust feature set, making it a highly reliable and effective data storage solution. Even in its largest configuration, the Scalar 1000 can move any cartridge to any drive in less than six seconds, with up to 350 cartridge swaps per hour. Its reliability rating—a full 1,000,000 cartridge swaps between failures—equates to almost two years of changing one cartridge every minute, 24 hours per day. This combination of performance and reliability makes the Scalar 1000 especially well-suited for imaging, archive, and file migration systems, where quick file recall and continual heavy use are demanded.

This library offers a wide range of features to ensure low-cost, secure, and minimal maintenance, including a keypad-secured mailbox to facilitate adding and removing tapes, and hot-swappable drives<sup>1</sup> to allow drive expansion/replacement without interrupting normal operations.

In addition, all major components are field replaceable in less than 30 minutes. For example, both DLT and AIT drive modules can be replaced within five minutes. To further simplify service and maintenance, the Scalar 1000 features built-in diagnostics that perform automated self-calibration and self-configuration routines.

### Key Features List

- Import/export mailbox
  - DLT: 12 slots
  - AIT: 18 slots
  - 3590: 12 slots
- Integrated barcode reader
- Visible and accessible drives and media
- Scalable, reliable design
- Engineered for easy serviceability
  - Drives upgraded or exchanged in 5 minutes
  - All major components are Field Replaceable Units (FRU)
- Mean Time To Repair (MTTR) of 30 minutes

## Flexible Drive Support

The Scalar 1000 library automates the most advanced tape technology available: Quantum DLT, Sony AIT and IBM 3590 Magstar. In addition, the Scalar 1000 can support both DLT and 3590 drives in the same library.<sup>2</sup> This flexibility allows customers to optimize the library configuration for high performance and high capacity. For more specific information about mixed media Scalar 1000 configurations, please contact ADIC.

## Performance & Reliability

The key performance specifications for the Scalar 1000 library are shown below.

### Performance Specifications

Average Swaps per hour	290
Peak Swaps per hour	350
Average Time to Mount Media	5 seconds
Max Time to Mount Media	6 seconds

The Scalar 1000 offers impressive reliability factors to ensure each customer's mission-critical data is securely stored and reliably accessed.

- Mean Cycles Before Failure (MCBF):
  - 1,000,000 complete cartridge swaps
  - 2,000,000 movements
- Low number of moving parts along the X & Y axis
- Mean Time Before Failure (MTBF):
  - 1,000,000 hours
- Automatic self tests upon error detection
- Alignment accuracy: Within 0.3 mm

<sup>1</sup> Without affecting library operation. Bus integrity must be sustained.

<sup>2</sup> Specific configurations only.

## Fibre Channel Capability

The Scalar 1000 is an effective candidate for use as a shared device in Fibre Channel networks due to its high capacity and large number of high-throughput drives. For customers requiring Storage Area Network (SAN) support, the Scalar 1000 library offers a Fibre Channel solution for increased bandwidth, easy scalability, and extended data transfer ranges. ADIC's Fibre Channel routers are easily integrated within the Scalar 1000, allowing the Scalar 1000 library to be used directly in SANs.

ADIC offers two routers designed for tape streaming operations that integrate within a Scalar 1000 library—the FCR 100 and FCR 200. Both routers are 1U in height yet offer different channel options. The FCR 100 offers one Fibre Channel port and one SCSI bus while the FCR 200 offers one Fibre Channel port and two SCSI busses.

Integrating Fibre Channel Routers into a Scalar 1000 is easy since the back of each Scalar 1000 module contains a standard rackmount system to seamlessly house and integrate up to six Fibre Channel routers. Library modules will utilize a certain number of routers, depending on the number of drives. The recommendation is two drives per SCSI bus. For example, twelve drives will utilize six FCR 100s. Since the FCR 200 supports two SCSI busses, twelve drives will utilize three FCR 200s. To integrate FCRs into the Scalar 1000, simply order a Fibre Channel Integration Kit (1 kit per router).

By integrating the Scalar 1000 and Fibre Channel Routers, ADIC provides customers a complete Fibre Channel solution package. Please contact an authorized ADIC reseller for pricing information about adding Fibre Channel to the Scalar 1000 library.



*A rear view of the Scalar 1000 with two back-loaded FCR 100/200 routers.*



*A rear view of the Scalar 1000 with two FCR 100/200 routers. Up to six FCR 100/200 routers can be rack mounted.*

## Planning Guidelines

Planning for a Scalar 1000 library involves several elements, ranging from physical location preparation to identifying cable requirements. To simplify this process, ADIC offers a comprehensive worksheet designed specifically for Scalar 1000 customers.

After determining the drive type, the number of drives and modules, simply work through the appropriate Scalar 1000 *Ordering Guidelines* worksheet to define the correct configuration. Customers can then correctly identify the needed accessories—such as interface cables and media—and order accordingly. ADIC works with its customers to ensure these items are available upon

the Scalar 1000's delivery. Please note that some items—such as cables, media, and installation costs—are separate and are not included in the base Scalar 1000 pricing.

The *Ordering Guidelines* worksheet is broken down by module and drive technology. Within any module, customers define the number of drives, the drive bay capacity, and drive-to-host drive cables. Customers will also identify which host interface cables are needed, both in quantity and length. Remember, a Scalar 1000 library can have numerous layout scenarios so use this worksheet to ensure that peripheral and accessory needs are properly identified.

**Scalar 1000 / DLT Ordering Guidelines Worksheet**      *Customer Profile*

**Customer Name:** \_\_\_\_\_

Use this form when ordering a Scalar 1000 with DLT drives.

1. What is your host type? <i>(Server specifications such as hardware and operating system details.)</i>															
2. What is your host SCSI controller type? <i>(Must be differential. Examples include Adaptec AHA-2944UW card.)</i>															
3. List the number of host controllers attaching to the Scalar 1000.															
4. List the type of connector. <i>(Must be HD68/HD68 interface.)</i>															
5. What backup software will be used? <i>(List all modules and version numbers.)</i>															
6. What operating system will be used? <i>(Examples include Microsoft NT, Netware, or HP.)</i>															
7. How many modules? <i>(You will need at least the control module. More expansion modules increase drive and tape capacities. Select all that apply.)</i> <input checked="" type="checkbox"/> Control Module <input type="checkbox"/> Expansion Module 1 <input type="checkbox"/> Expansion Module 2 <input type="checkbox"/> Expansion Module 3 ___ (6 or 12 drive bay)    ___ # Drive Bays (0,6,12)    ___ # Drive Bays (0,6,12)    ___ # Drive Bays (0,6,12)															
8. How many drives per module? (1-12 drives) <i>(This determines the correct number of drive bays for each module.)</i> ___ Control Module    ___ Expansion Module 1    ___ Expansion Module 2    ___ Expansion Module 3															
9. How many drives total? (1-48 drives) <i>(DLT 7000 Differential drives only.)</i>															
10. How many drives per SCSI controller? <i>(A general guideline is 2 drives per controller.)</i>															
11. Robot connection point: Is it shared with the drives?															
12. Select the appropriate power line cord for your location. <i>(Must select one of these options.)</i> <input type="checkbox"/> North America <input type="checkbox"/> International <input type="checkbox"/> Germany															
13. Cable Configuration <i>(Cables must be HD68/HD68 interface. Cable costs are separate.)</i>															
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%; text-align: center;">Quantity</th> <th style="width: 15%; text-align: center;">Length</th> </tr> </thead> <tbody> <tr> <td>Library-to-host cable (15' or 30')</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Drive-to-drive cables (at least 2' long)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Drive-to-host cables (for multiple hosts; 15' or 30')</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Controller-to-drive cable (required)</td> <td style="text-align: center;">1</td> <td style="text-align: center;">6'</td> </tr> </tbody> </table>		Quantity	Length	Library-to-host cable (15' or 30')	_____	_____	Drive-to-drive cables (at least 2' long)	_____	_____	Drive-to-host cables (for multiple hosts; 15' or 30')	_____	_____	Controller-to-drive cable (required)	1	6'
	Quantity	Length													
Library-to-host cable (15' or 30')	_____	_____													
Drive-to-drive cables (at least 2' long)	_____	_____													
Drive-to-host cables (for multiple hosts; 15' or 30')	_____	_____													
Controller-to-drive cable (required)	1	6'													
14. Is proper power receptacle (L5-20) available for Scalar 1000? <i>See Environmental Overview for details.</i> <input type="checkbox"/> Y <input type="checkbox"/> N															
15. Additional accessories. <i>(See list below for accessories included with the Scalar 1000.)</i>															
<input type="checkbox"/> Media      Qty _____															
<input type="checkbox"/> Barcode labels <i>(Order appropriate sequence based on labels included in accessory kit.)</i> Qty _____															
<input type="checkbox"/> Cleaning media      Qty _____															

**Each Scalar 1000 / DLT library includes these accessories:**

- Barcode labels (series 1-297) *with Control Module*
- Barcode labels (series 298-693) *with Expansion Module*
- Operator Guide manual
- Maintenance Guide manual
- 1 DLT media per drive
- 1 DLT cleaning cartridge per drive
- 1 terminator per drive

Scalar 1000 / AIT Ordering Guidelines Worksheet Customer Profile

Customer Name: \_\_\_\_\_

Use this form when ordering a Scalar 1000 with AIT drives.

1. What is your host type? <i>(Server specifications such as hardware and operating system details.)</i>															
2. What is your host SCSI controller type? <i>(Must be differential. Examples include Adaptec AHA-2944UW card.)</i>															
3. List the number of host controllers attaching to the Scalar 1000.															
4. List the type of connector. <i>(Must be HD68/HD68 interface.)</i>															
5. What backup software will be used? <i>(List all modules and version numbers.)</i>															
6. What operating system will be used? <i>(Examples include Microsoft NT, Netware, or HP.)</i>															
7. How many modules? <i>(You will need at least the control module. More expansion modules increase drive and tape capacities. Select all that apply.)</i> <input checked="" type="checkbox"/> Control Module <input type="checkbox"/> Expansion Module 1 <input type="checkbox"/> Expansion Module 2 <input type="checkbox"/> Expansion Module 3 ___ (12 drive bay)    ___ # Drive Bays (0,12)    ___ # Drive Bays (0,12)    ___ # Drive Bays (0,12)															
8. How many drives per module? (2-12 drives) <i>(This determines the correct number of drive bays for each module. Remember that AIT drives are offered in pairs.)</i> ___ Control Module    ___ Expansion Module 1    ___ Expansion Module 2    ___ Expansion Module 3															
9. How many drives total? (2-48 drives) <i>(AIT Differential drives only.)</i>															
10. How many drives per SCSI controller? <i>(A general guideline is 2 drives per controller.)</i>															
11. Robot connection point: Is it shared with the drives?															
12. Select the appropriate power line cord for your location. <i>(Must select one of these options.)</i> <input type="checkbox"/> North America <input type="checkbox"/> International <input type="checkbox"/> Germany															
13. Cable Configuration <i>(Cables must be HD68/HD68 interface. Cable costs are separate.)</i>															
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14. Is proper power receptacle (L5-20) available for Scalar 1000? <i>See Environmental Overview for details.</i> <input type="checkbox"/> Y <input type="checkbox"/> N															
15. Additional accessories. <i>(See list below for accessories included with the Scalar 1000.)</i>															
<input type="checkbox"/> Media <span style="float: right;">Qty _____</span>															
<input type="checkbox"/> Barcode labels <i>(Order appropriate sequence based on labels included in accessory kit.)</i> <span style="float: right;">Qty _____</span>															
<input type="checkbox"/> Cleaning media <span style="float: right;">Qty _____</span>															

**Each Scalar 1000 / AIT library includes these accessories:**

- Barcode labels (series 0-359) *with Control Module*
- Barcode labels (series 360-719) *with Expansion Module*
- Operator Guide manual
- Maintenance Guide manual
- 1 AIT media per drive
- 1 AIT cleaning cartridge per drive
- 1 terminator per drive

**Scalar 1000 / 3590 Ordering Guidelines Worksheet** *Customer Profile*

**Customer Name:** \_\_\_\_\_

Use this form when ordering a Scalar 1000 with 3590 drives.

1. What is your host type? <i>(Server specifications such as hardware and operating system details.)</i>															
2. What is your host SCSI controller type? <i>(Must be differential. Examples include Adaptec AHA-2944UW card.)</i>															
3. List the number of host controllers attaching to the Scalar 1000.															
4. List the type of connector. <i>(Must be HD68/HD68 interface.)</i>															
5. What backup software will be used? <i>(List all modules and version numbers.)</i>															
6. What operating system will be used? <i>(Examples include Microsoft NT, Netware, or HP.)</i>															
7. How many modules? <i>(You will need at least the control module. More expansion modules increase drive and tape capacities. Select all that apply.)</i> <input checked="" type="checkbox"/> Control Module <input type="checkbox"/> Expansion Module 1 <input type="checkbox"/> Expansion Module 2 <input type="checkbox"/> Expansion Module 3 ___ (2 or 4 drive bay)    ___ # Drive Bays (0,2,4)    ___ # Drive Bays (0,2,4)    ___ # Drive Bays (0,2,4)															
8. How many drives per module? (1-4 drives) <i>(This determines the correct number of drive bays for each module.)</i> ___ Control Module    ___ Expansion Module 1    ___ Expansion Module 2    ___ Expansion Module 3															
9. How many drives total? (1-16 drives) <i>(IBM 3590 Differential drives only.)</i>															
10. How many drives per SCSI controller? <i>(A general guideline is 2 drives per controller.)</i>															
11. Robot connection point: Is it shared with the drives?															
12. Select the appropriate power line cord for your location. <i>(Must select one of these options.)</i> <input type="checkbox"/> North America <input type="checkbox"/> International <input type="checkbox"/> Germany															
13. Cable Configuration <i>(Cables must be HD68/HD68 interface. Cable costs are separate.)</i>  <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left;"></th> <th style="text-align: center;">Quantity</th> <th style="text-align: center;">Length</th> </tr> </thead> <tbody> <tr> <td>Library-to-host cable (15' or 30')</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Drive-to-drive cables (at least 2' long)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Drive-to-host cables (for multiple hosts; 15' or 30')</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Controller-to-drive cable (required)</td> <td style="text-align: center;">1</td> <td style="text-align: center;">6'</td> </tr> </tbody> </table>		Quantity	Length	Library-to-host cable (15' or 30')	_____	_____	Drive-to-drive cables (at least 2' long)	_____	_____	Drive-to-host cables (for multiple hosts; 15' or 30')	_____	_____	Controller-to-drive cable (required)	1	6'
	Quantity	Length													
Library-to-host cable (15' or 30')	_____	_____													
Drive-to-drive cables (at least 2' long)	_____	_____													
Drive-to-host cables (for multiple hosts; 15' or 30')	_____	_____													
Controller-to-drive cable (required)	1	6'													
14. Is proper power receptacle (L5-20) available for Scalar 1000? <i>See Environmental Overview for details.</i> <input type="checkbox"/> Y <input type="checkbox"/> N															
15. Additional accessories. <i>(See list below for accessories included with the Scalar 1000.)</i>  <input type="checkbox"/> Media    Qty _____ <hr/> <input type="checkbox"/> Barcode labels <i>(Order appropriate sequence based on labels included in accessory kit.)</i> Qty _____ <hr/> <input type="checkbox"/> Cleaning media    Qty _____															

**Each Scalar 1000 / 3590 library includes these accessories:**

- Operator Guide manual
- Maintenance Guide manual
- 2 terminators per drive
- Dual port adapter

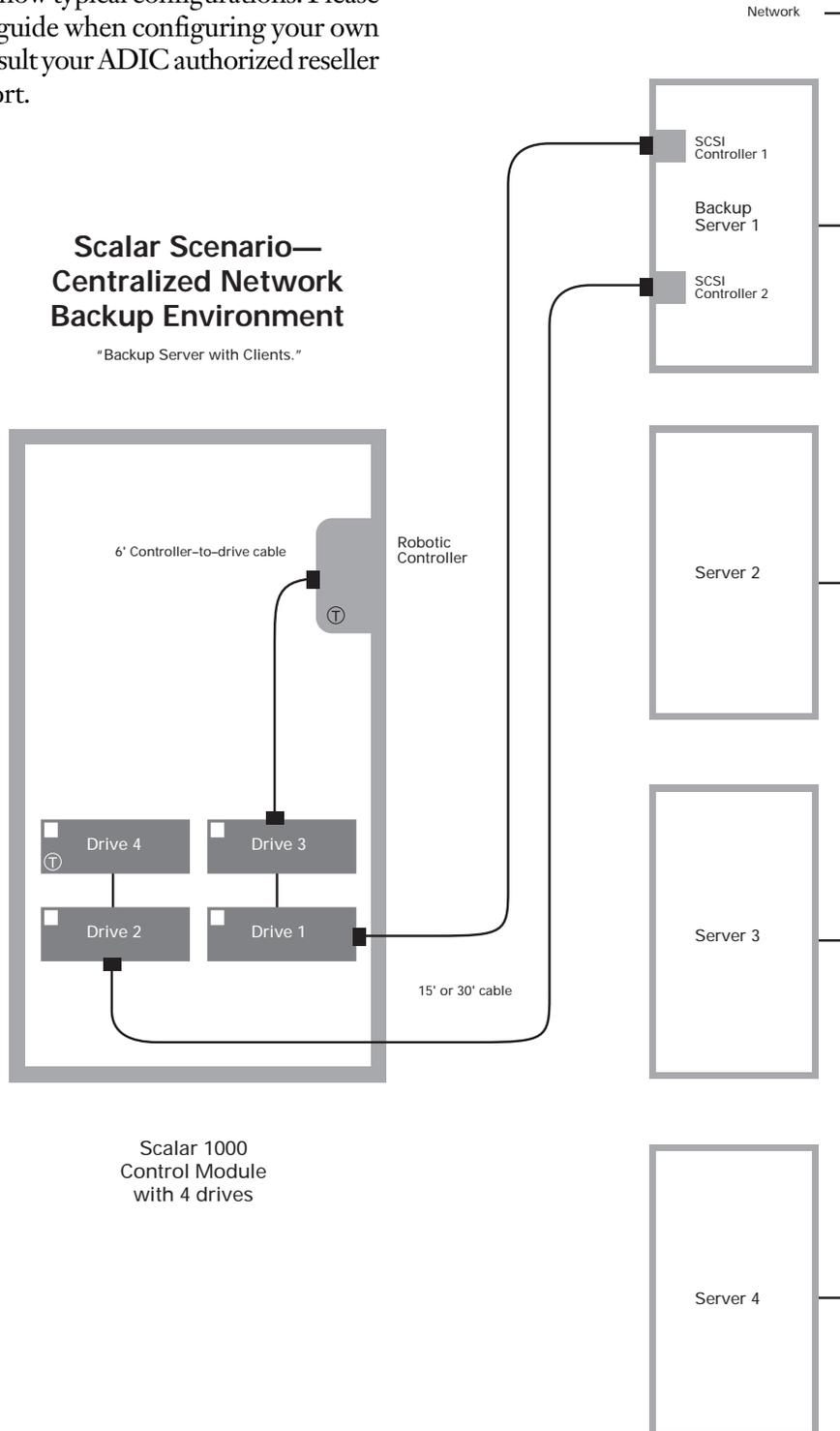
## Configuration Diagrams

### Visually Configuring a Scalar 1000 Library

Another aspect of this Ordering Guidelines worksheet is to assist customers in visually diagramming a Scalar 1000 library. While many configuration scenarios are possible, these sample diagrams show typical configurations. Please use these diagrams as a guide when configuring your own Scalar 1000 library. Consult your ADIC authorized reseller for configuration support.

### Scalar Scenario— Centralized Network Backup Environment

"Backup Server with Clients."



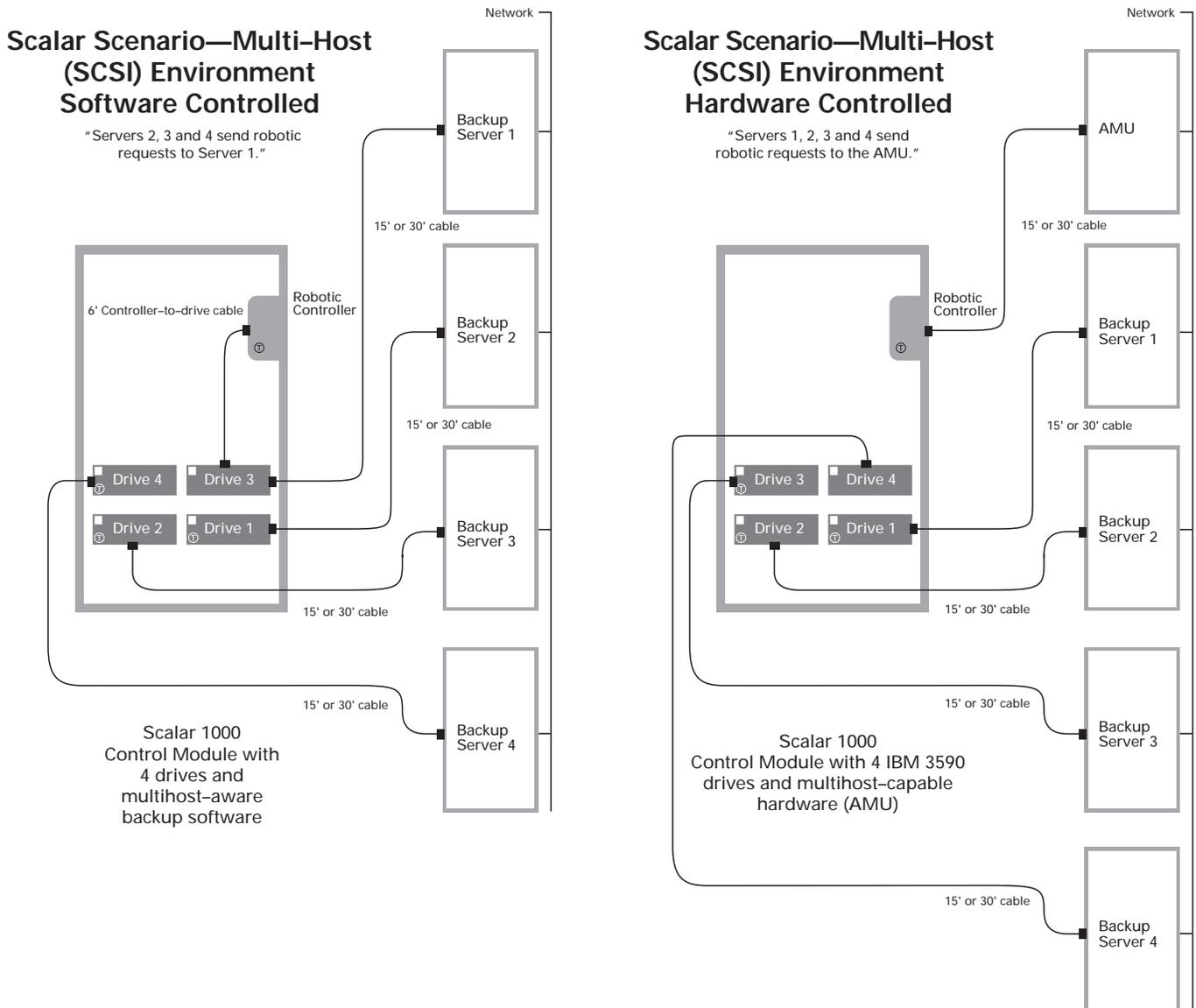
Configuration Diagrams, *continued*

The following two examples illustrate different ways to configure a Scalar 1000 within a multihost environment.

The AMU, consisting of a control computer and DAS software, allows customers to connect multiple servers to the same Scalar 1000 library at the same time. Specifically, the AMU's functions include:

- Provides host communication
- User interface for operation and service
- Robotic controller communication
- Tape slot management

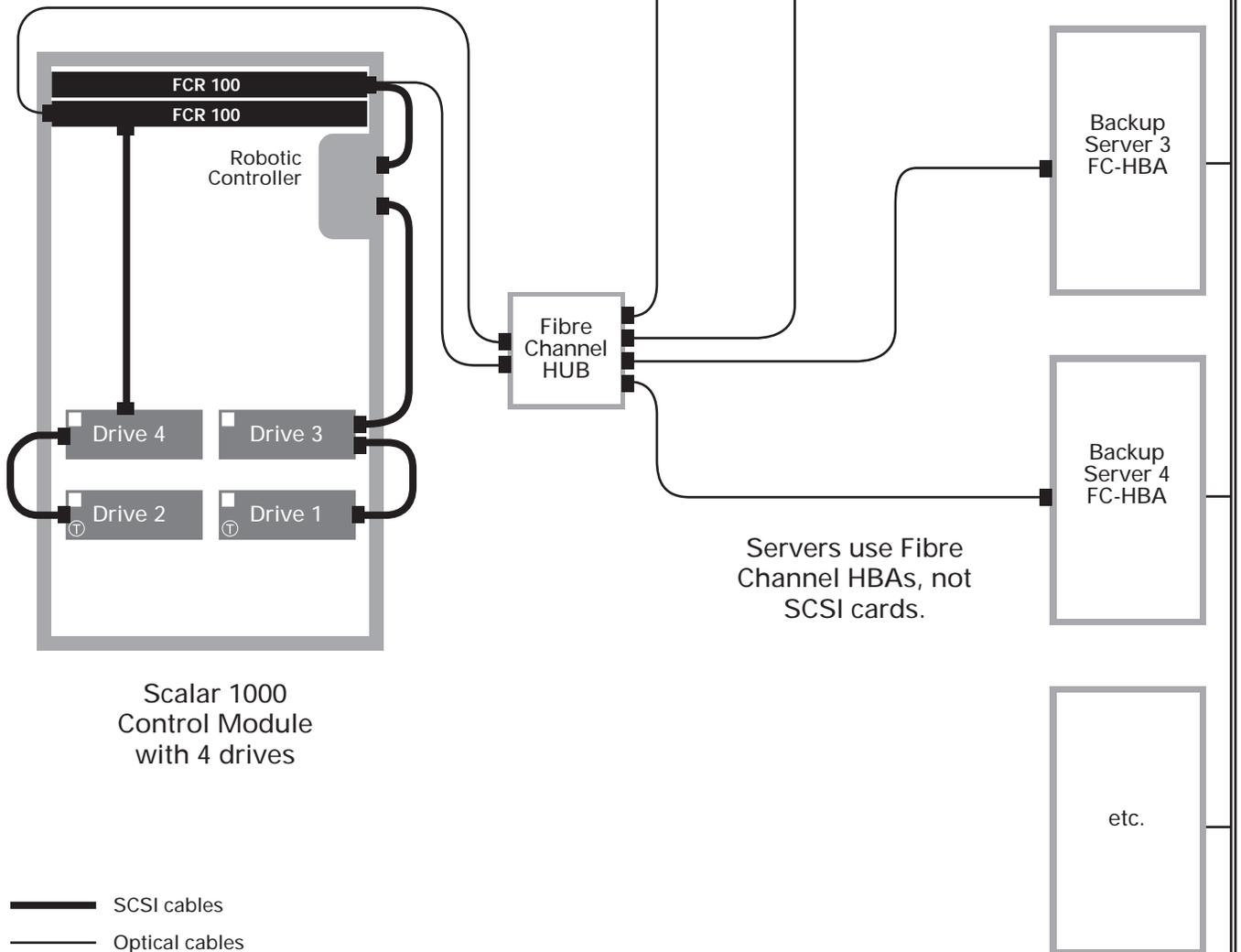
The diagram below depicts a typical Scalar 1000 with IBM 3590 drives, running an AMU configuration.



### Configuration Diagrams, *continued*

This diagram illustrates a Scalar 1000 Fibre Channel environment. Note the usage of both SCSI and fiber optic cables.

#### Scalar Scenario—Fibre Channel with Host Bus Adapter (HBA) Shared Resource Environment



## Location Preparation Guidelines

The Scalar 1000 has a series of specifications, ranging from physical to electrical, that vary depending on the configuration of choice. The following hardware information relates to all Scalar 1000 configurations, regardless of the drive technology being used.

### Physical Dimensions

Control Module		North America	Europe
<b>Height</b>		6 feet	1.83 m
<b>Width</b>		2 feet 6 inches	0.76 m
<b>Depth</b>	DLT, AIT 3590	3 feet 11 inches 5 feet	1.19 m 1.52 m
<b>Maximum Weight<sup>1</sup></b>		1052 lbs	477 kg
<b>Distributed Load</b>		85 lbs/sq ft	419 kg/sq m

*Control Module Physical Dimensions*

Expansion Module		North America	Europe
<b>Height</b>		6 feet	1.8 m
<b>Width</b>		2 feet 6 inches	0.76 m
<b>Depth</b>	DLT, AIT 3590	3 feet 11 inches 5 feet	1.19 m 1.52 m
<b>Maximum Weight<sup>1</sup></b>		817 lbs	372 kg
<b>Distributed Load</b>		66 lbs/sq ft	326 kg/sq m

*Expansion Module Physical Dimensions*

## Shipping Requirements

When crated for shipping and delivery, the Scalar 1000 needs a certain amount of space to clear building openings. Shipped product dimensions are identified below so customer sites can determine, in advance, the ideal delivery location and proper door openings.

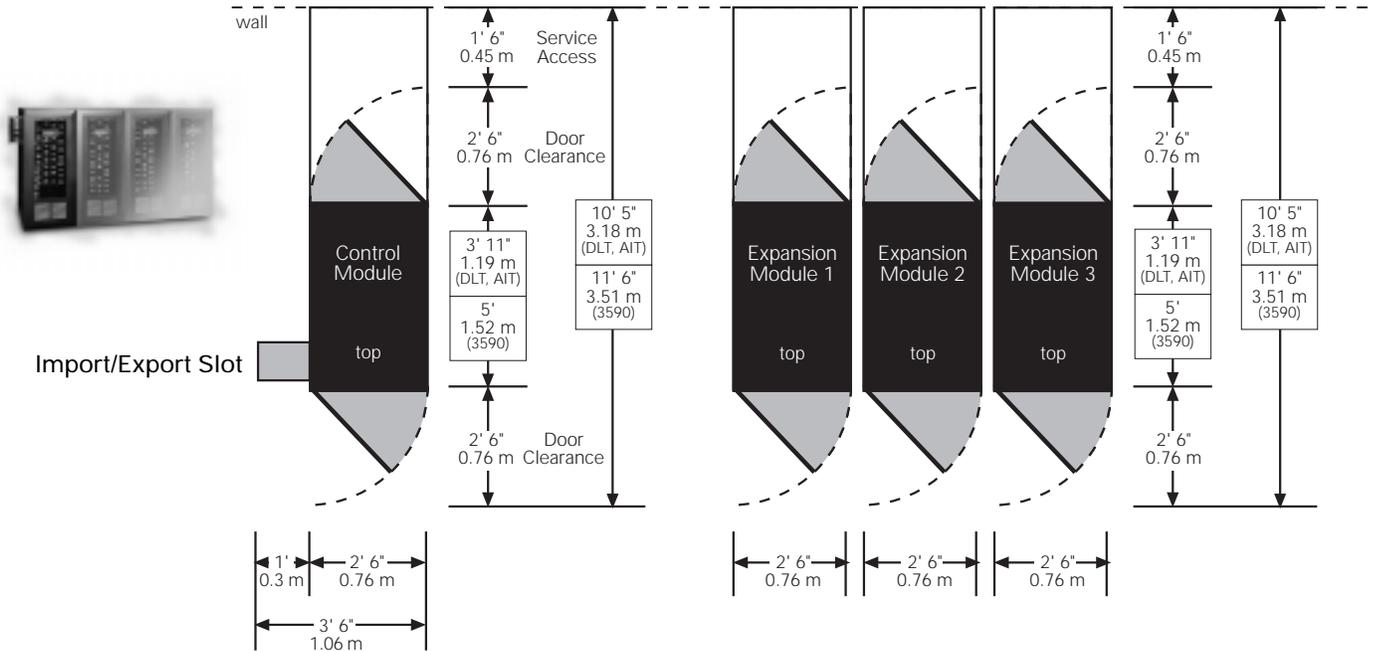
Control or Expansion Module		North America	Europe
<b>Height</b>		6 feet 6 inches	1.98 m
<b>Width</b>		2 feet 11 inches	0.9 m
<b>Depth</b>	DLT, AIT 3590	5 feet 5 inches 6 feet 6 inches	1.65 m 1.98 m
<b>Maximum Weight</b>		1100 lbs	499 kg



<sup>1</sup> Includes the weight of (12) DLT 7000 tape drives or equivalently (4) IBM 3590 drives.

**Scalar 1000 Library Overall Dimension Requirements**

Maximum Scalar 1000 Library Configuration — An Aerial View



Service Access Area is the 1'6" area behind the Scalar 1000's back door clearance.

Planning is key. Given the size of the Scalar 1000, it requires a certain amount of dedicated space for optimal access. Please consult the layout diagram and size specifications to ensure the ideal Scalar 1000 location is identified before installation.

This *Dimension Requirements* diagram illustrates the space needed for these major points of access:

ACCESS POINT	PURPOSE
• Import/export mailbox	To load media
• Front cabinet door	To access media and drives
• Back cabinet door	To access cables and allow for service access

If service personnel need to access the back of the Scalar 1000, the door requires 2 feet and 6 inches of clearance. To properly access the import/export slot at least one foot of clearance is needed. As expansion modules are added, additional space requirements should be considered. Each expansion module adds another 2 feet and 6 inches in width. In total, the maximum Scalar 1000 library configuration—one control module and three expansion modules—is 10 feet in width.

## Environmental Overview

The Scalar 1000 library has unique electrical specifications for the control module, expansion modules, and tape drives as illustrated in the table below. These descriptions vary from power consumption to special power supply parameters.

### Control Module Electrical Specifications

Each Scalar 1000 module requires a dedicated, hardwired 20 amp circuit. This must be in place before Scalar 1000 modules can be installed.

Control Module (Single Phase)		
	North America	Europe
Voltage <sup>a</sup>	115	230
KVA	1.6	1.6
AMP <sup>b</sup>	14	7
KW/hour	0.36	0.36
Receptacle <sup>d</sup>	L5-20	c

### Expansion Module Electrical Specifications

Expansion Module (Single Phase)		
	North America	Europe
Voltage <sup>a</sup>	115	230
KVA	1.6	1.6
AMP	14	7
KW/hour	0.36	0.36
Receptacle <sup>d</sup>	L5-20	c

- Connect an 18-gauge stranded copper wire from the control module cabinet to an earth ground.
- Includes the drive components.
- Cable and receptacle determined by location.
- To ensure adequate power supply, the Scalar 1000 library requires a dedicated, hardwired 20 amp circuit and an L5-20 type connector, commonly referred to as a "20 amp/twist lock" connector.

## Scalar 1000 Drive Component Electrical Specifications

Device <sup>a</sup> (Single Phase)			
	DLT 7000	AIT1 (pair of drives)	3590
Voltage	100-240 VAC	100-240 VAC	100-240 VAC
KVA	0.1	0.1	0.25
AMP	1	1	2.5

### BTU Guidelines

For customers interested in the BTU (British Thermal Unit) values associated with a Scalar 1000 library, here are some general guidelines:

#### DLT

- Control module with 12 DLT drives - 4500 BTU/hr
- 12 DLT drives at steady state - 126 BTU/hr
- 12 DLT drives during operative mode - 160 BTU/hr

#### AIT

- Control module with 12 AIT drives - 575 BTU/hr
- AIT drive module (drive pair) at steady state - 18 BTU/hr
- AIT drive module (drive pair) during operative mode - 18 BTU/hr

#### IBM 3590

- IBM 3590 drive module at steady state - 73 BTU/hr
- IBM 3590 drive module during operative mode - 73 BTU/hr

## Accessories

Included with each Scalar 1000 library are several accessory items that complement the functionality of this product. Please note that accessory kits vary by the drive type used in the Scalar 1000.

Some items, such as barcode labels, are included to provide customers with a sufficient start quantity. However, customers may choose to order more of these items, depending on their unique configuration requirements. Listed below are the accessories that ship with each Scalar 1000 library:

### Scalar 1000 / DLT

- Barcode labels (Series 1-297) with Control Module
- Barcode labels (Series 298-693) with Expansion Module #1
- Operator Guide manual
- Maintenance Guide manual
- 1 DLT media per drive
- 1 DLT cleaning cartridge
- 1 terminator per drive

### Scalar 1000 / AIT

- Barcode labels (Series 0-359) with Control Module
- Barcode labels (Series 360-719) with Expansion Module #1
- Operator Guide manual
- Maintenance Guide manual
- 1 AIT media per drive
- 1 AIT cleaning cartridge
- 1 terminator per drive

### Scalar 1000 / 3590

- Operator Guide manual
- Maintenance Guide manual
- 2 terminators per drive
- Dual port adapter

## Points of Contact

ADIC wants its customers to experience a positive Scalar 1000 sales, integration, and installation process. A major component is communication—to identify company contacts and specific functions so customers know what to expect and from whom. Typically, ADIC, in conjunction with its authorized reseller, works with the customer to address qualification issues such as:

- Software compatibility
- Accessory requirements
- Cable requirements
- Installation scheduling

ADIC's North American corporate phone number is 1-800-336-1233. In Europe, please contact ADIC Europe at +33 (0) 1 30 87 53 00 or ADIC / GRAU Storage Systems at +49 6142 9923 0.

## Installation

The Scalar 1000 requires an ADIC installation Customer Engineer (CE) to perform the library installation. Please consult your ADIC reseller for an installation price quote. ADIC installation services include installing and configuring the Scalar 1000 library (hardware) and a comprehensive, customized product overview. This hands-on training will give library operators first hand training and guidance. Please note that customers are responsible for the backup software installation.

Proper site preparation simplifies the installation process so utilize this guide to identify those items requiring customer attention. Before the actual installation, the ADIC CE will call the customer to review the necessary preparation steps, select the install date, and answer any questions. Total install time varies by customer site, but to provide adequate time, customers should plan on one day to complete the Scalar 1000 installation.

## Service and Warranty

The Scalar 1000 library's service and support levels are unmatched. One year of on-site service is included in the Scalar 1000 North American list price. DLT and AIT drives carry a three year warranty. IBM 3590 drives carry a one year warranty. In addition, customers may also upgrade on-site service response levels to suit specific support requirements.

Please contact an authorized North American ADIC reseller for complete service price quotes. For information about services available in Europe, please contact ADIC Europe at +33 (0) 1 30 87 53 00 or ADIC / GRAU Storage Systems at +49 6142 9923 0.

## Conclusion

By offering the Scalar 1000, ADIC is able to provide customers with a cost-effective, reliable and flexible data storage solution that grows with customer requirements. ADIC recognizes that its customers have unique yet equally important storage needs.

With the Scalar 1000 library, ADIC puts the storage growth choice where it belongs—with the customer.

## Library Configurations

	Scalar 1000		DLT7000 Total Capacity <sup>1</sup>	DLT8000 Total Capacity <sup>1</sup>
	DLT Drives	DLT Cartridges		
Tape Capacity				
Base Control Module:	1 to 12	118 to 158	11.1TB	12.6TB
With 1 Expansion Module:	1 to 24	248 to 368	25.8TB	29.4TB
With 2 Expansion Modules:	1 to 36	378 to 578	40.5TB	46.2TB
With 3 Expansion Modules:	1 to 48	508 to 788	55.2TB	63.0TB

## Drive and Performance

	DLT7000	DLT8000
Drive Type:	DLT7000	DLT8000
Data Cartridge Capacity		
Native:	35GB	40GB
with 2:1 Compression:	70GB	80GB
Transfer Rate per drive		
Native:	300MB/min	360MB/min
with Compression:	600MB/min	
File Access Time (Avg):	60 seconds	
Data Compression:	On-board DCLZ with variable block size	
Recording Format:	Multiple Track, Linear Serpentine	
Data Buffer:	8MB, cache buffer adjusts to host rates	
Media:	DLTape™ IV	
Tape Length:	1800 feet	
Recording Density:	86,000 bits/in	100,000 bits/in
Tracks Per Tape:	208	
Error Correction Code:	Reed Solomon ECC; 64-bit CRC on each 4KB of data; 16-bit CRC on each record; Internal parity checking on cache buffer	

## Operation

Cartridge Change:	6 seconds maximum
Indicators:	Password-protected keypad with LCD menu display
Drive:	Write Protected, Tape in Use, Use Cleaning Tape, and Tape Density LEDs; Density Select, Tape Unload Controls
Drive Interface:	Fast and Wide SCSI-2 Differential
Library Interface:	SCSI-2 Differential
SCSI Connections:	68-pin micro-D

## Reliability

Hard Error Rate:	Less than 1 in 10 <sup>17</sup> bits read
Tape Shelf Life:	30 years minimum (at 20°C, 40% RH)
Maintenance:	Periodic drive head cleaning with DLT Cleaning Cartridge
MSBF:	Greater than 1,000,000 cartridge changes
MTTR:	Less than 30 minutes
Field Replaceable:	Drives, Power Supplies, Gripper Assembly, Barcode Reader, Control Electronics Module, Hot Swappable Drives <sup>2</sup>
Diagnostics:	Built-In-Test (BIT), Store/Recall Past Events, "Fault Isolation" Assistance, Self Initiating Configuration and Calibration Routines

## Physical

Control Module:	29.5"W x 47"D x 72"H (74.9cm x 119.4cm x 182.9cm)
Weight:	1052 lbs. (477Kg) maximum weight
Expansion Module:	29.5"W x 47"D x 72"H (74.9cm x 119.4cm x 182.9cm)
Weight:	817 lbs (372Kg)

## Environmental

Electrical:	115/230 VAC, 1.6kVa
Altitude:	30,000 feet
Temperature:	16°C to 32°C Operating
Humidity:	15 to 75% Non-Condensing Operating

## Compliance and Certification

	Year 2000 Compliant
Safety:	UL-1950 ITE, CSA950, EN 60950
Emissions:	FCC #47 CFR, Part 15, Class A, CSA C108.8M, EN 55022, Class A
Immunity:	IEC (1000-4-2, 3, 4)
International:	CE

## Software and Platforms

Consult the most recent ADIC Software Compatibility Guide for a complete list of software and platforms compatible with the Scalar Series.

<sup>1</sup> with 2:1 compression.

<sup>2</sup> without affecting library operation. Bus integrity must be sustained.

**Year 2000  
Compliant**

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**Library Configurations**

	Scalar 1000		AIT1 Total Capacity <sup>2</sup>	AIT2 Total Capacity <sup>3</sup>
	AIT Drives <sup>1</sup>	AIT Cartridges		
Base Control Module:	2 to 12	237	16.6TB	23.7TB
With 1 Expansion Module:	2 to 24	492 to 552	38.6TB	55.2TB
With 2 Expansion Modules:	2 to 36	747 to 867	60.7TB	86.7TB
With 3 Expansion Modules:	2 to 48	1002 to 1182	82.7TB	118.2TB

**Drive and Performance**

Drive Type:	AIT1	AIT2
Data Cartridge Capacity	AIT	AIT2
Native:	35GB	50GB
with 2:1 Compression:	70GB	100GB
Transfer Rate per drive		
Native:	180MB/min	360MB/min
with 2:1 Compression:	360MB/min	720MB/min
File Access Time (Avg):	37 seconds with MIC	
Data Compression:	ALDC (Adaptive Lossless Data Compression)	
Data Buffer:	4MB	8MB
Media:	AIT1	AIT2
Tape Length:	230m	
Recording Density:	116,000 bits/in	167,000 bits/in
Error Correction Code:	Read after write enhanced C3 ECC	

**Operation**

Cartridge Change:	6 seconds maximum
Indicators:	Password-protected keypad with LCD menu display
Drive:	Status LED and eject buttons
Drive Interface:	Fast and Wide SCSI-2 Differential
Library Interface:	SCSI-2 Differential
SCSI Connections:	68-pin micro-D

**Reliability**

Hard Error Rate:	Less than 1 in 10 <sup>17</sup> bits read
Tape Shelf Life:	30 years minimum (at 20°C, 40% RH)
Maintenance:	Cleaning not required unless indicated by drive LEDs
MSBF:	Greater than 1,000,000 cartridge changes
MTTR:	Less than 30 minutes
Drive MTBF:	Greater than 200,000 power-on hours
Field Replaceable:	Drives, Power Supplies, Gripper Assembly, Barcode Reader, Control Electronics Module, Hot Swappable Drives <sup>4</sup>
Diagnostics:	Built-In-Test (BIT), Store/Recall Past Events, "Fault Isolation" Assistance, Self Initiating Configuration and Calibration Routines

**Physical**

Control Module:	29.5"W x 47"D x 72"H (74.9cm x 119.4cm x 182.9cm)
Weight:	1052 lbs. (477Kg) maximum weight
Expansion Module:	29.5"W x 47"D x 72"H (74.9cm x 119.4cm x 182.9cm)
Weight:	817 lbs (372Kg)

**Environmental**

Electrical:	115/230 VAC, 1.6kVa
Altitude:	10,000 feet
Temperature:	16°C to 32°C Operating
Humidity:	15 to 75% Non-Condensing Operating

**Compliance and Certification**

	Year 2000 Compliant
Safety:	UL-1950 ITE, CSA950, EN 60950
Emissions:	FCC #47 CFR, Part 15, Class A, CSA C108.8M, EN 55022, Class A
Immunity:	IEC (1000-4-2, 3, 4)
International:	CE

**Software and Platforms**

Consult the most recent ADIC Software Compatibility Guide for a complete list of software and platforms compatible with the Scalar Library Series.

<sup>1</sup> AIT drives offered in pairs.

<sup>2</sup> with 2:1 compression. Capacities specified use 230m media. For 170m media reduce capacity by 28.6%

<sup>3</sup> With 2:1 compression.

<sup>4</sup> Without affecting library operation. Bus integrity must be sustained.



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### Library Configurations

	3590 Drives	Scalar 1000 3590 Cartridges	Total Capacity <sup>1</sup>
Tape Capacity:	3590 Drives	3590 Cartridges	4.7TB
Base Control Module:	1 to 4	118 to 158	4.7TB
With 1 Expansion Module:	1 to 8	248 to 368	11.0TB
With 2 Expansion Modules:	1 to 12	378 to 578	17.3TB
With 3 Expansion Modules:	1 to 16	508 to 788	23.6TB

### Drive and Performance

Drive Type:	IBM 3590
Data Cartridge Capacity	
Native:	10GB
with 3:1 Compression:	30GB
Transfer Rate per drive	
Native:	540MB/min
with 3:1 Compression:	1.62 GB/min
File Access Time (Avg):	16 seconds
Data Compression:	LZ1 Compression Standard
Recording Format:	Multiple Track Serpentine Longitudinal
Search Speed:	5 meters / second
Media:	Linear Half Inch Tape
Tape Length:	1050 feet
Tracks Per Tape:	128 (8 sets of 16 tracks)
Error Correction Code:	Multi-level Reed Solomon ECC

### Operation

Cartridge Change:	6 seconds maximum
Library Indicators:	Keypad with LCD menu display
Drive Indicators:	Operator / Service panel with display menu control switches
Drive:	Write Protected, Tape in Use, Use Cleaning Tape, and Tape Unload Controls
Drive Interface:	Wide Ultra SCSI Differential
Library Interface:	SCSI-2 Differential
SCSI Connections:	68-pin micro-D

### Reliability

Maintenance:	Periodic drive head cleaning with 3590 Cleaning Cartridge
MSBF:	Greater than 1,000,000 cartridge changes
MTTR:	Less than 30 minutes
Field Replaceable:	Power Supplies, Gripper Assembly, Barcode Reader, Control Electronics Module, Drive Components
Diagnostics:	Built-In-Test (BIT), Store/Recall Past Events, "Fault Isolation" Assistance, Self Initiating Configuration and Calibration Routines

### Physical

Control Module:	29.5"W x 60"D x 72"H (74.9cm x 152.4cm x 182.9cm)
Weight:	1052 lbs. (477Kg) maximum weight
Expansion Module:	29.5"W x 60"D x 72"H (74.9cm x 152.4cm x 182.9cm)
Weight:	817 lbs (372Kg)

### Environmental

Electrical:	115/230 VAC, 1.6kVa
Temperature:	16°C to 32°C Operating
Humidity:	20 to 80% Non-Condensing Operating

### Compliance and Certification

	Year 2000 Compliant
Safety:	UL-1950 ITE, CSA950, EN 60950
Emissions:	FCC #47 CFR, Part 15, Class A, CSA C108.8M, EN 55022, Class A
Immunity:	IEC (1000-4-2, 3, 4)
International:	CE

### Software and Platforms

Consult the most recent ADIC Software Compatibility Guide for a complete list of software and platforms compatible with the Scalar Library Series.

<sup>1</sup> With 3:1 compression per IBM specifications.

**Year 2000  
Compliant**

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