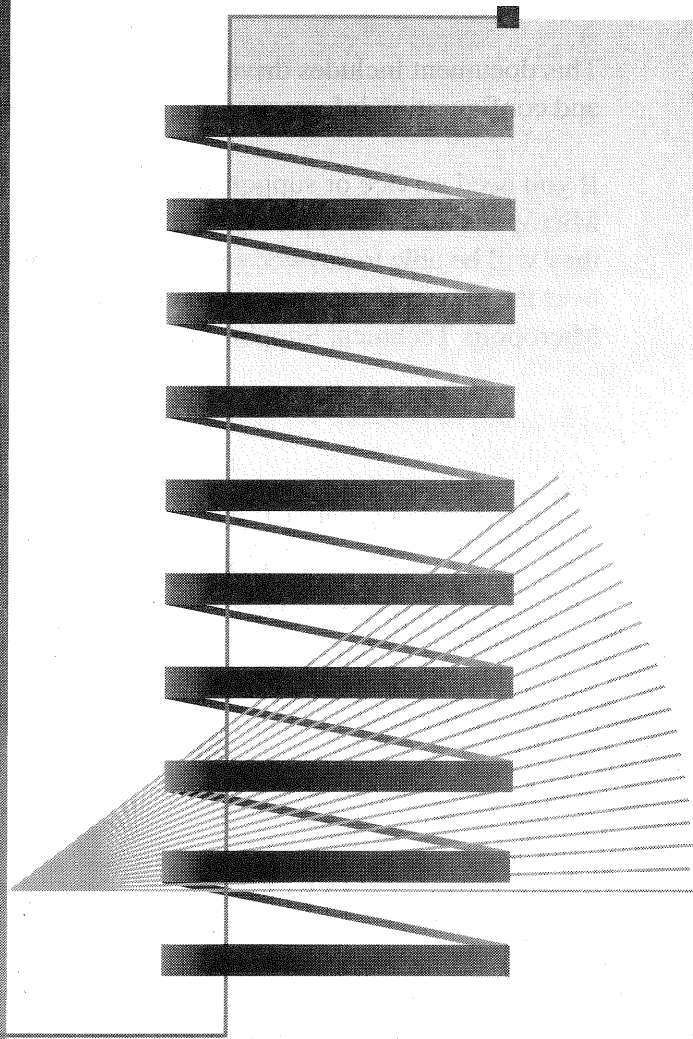# 4110 DRIVE - SCSI

1,052 MB Formatted Capacity;
3 1/2-inch, One-Inch High Form Factor;
Fast SCSI-2 Interface with
Single-Ended Drivers/Receivers

MICROPOLIS

Dear Customer,

Congratulations! You're now the proud owner of a Super-Capacity™ disk drive from Micropolis, a leader in high-quality, high-capacity, high-performance hard disk drives. Micropolis offers a complete line of high-capacity 5 1/4 and 3 1/2-inch hard disk drive products for all of your high-capacity applications.

After unpacking your Micropolis disk drive, please be sure to save your shipping container.

This document includes drive specifications along with installation and configuration information for typical system integration.

If you need service or support during installation or operation of a Micropolis disk drive, please contact your Reseller. In most cases they will be able to answer your questions and/or resolve issues over the phone. If they are unable to help you, please call Micropolis Technical Support (see page 11).

Contents

Drive Specifications – Model 4110

Capacity

Unformatted

Per Drive	1,205 MB
Per Track	Variable
Per Surface	133.85 MB
Cylinders	2,428
Read/Write Heads	9

Formatted

Per Drive	1,052 MB
Bytes per Sector	512
Sectors per Track	Variable
Cylinders	2,415

Performance

|	
Avg. Seek Time (including settling time)	8.5 msec
Avg. Rotational Latency	5.56 msec
Rotational Speed	5400 rpm ± 0.5%
Data Transfer Rate at Interface	
Synchronous	up to 10 MB/sec
Asynchronous	up to 5 MB/sec
Internal Data Rate	30-47 Mbits/sec
MTBF (power-on hours)	500,000
Positioner	Fully balanced rotary voice coil
Parking	Automatic park and lock

General Functional Specifications

Interface	Fast SCSI-2
Supports Full Common Command Set	Yes
Drivers/Receivers	Single-ended

Power Requirements

+12V ±5% (average)	0.6 A
+12V ±5% (max during start-up)	1.5 A
+5V ±5% (average)	0.85 A
Power Dissipation, typical, idling	7 Watts
Power Dissipation, typical, seeking	8.25 Watts

Dimensions & Mounting

The Micropolis 4110 drive uses industry-standard mounting for 3 1/2-inch "one-inch high" Winchester disk drives. It is designed such that the outer frame should be hard-mounted to the host equipment; no additional/external shock mounts should be used.
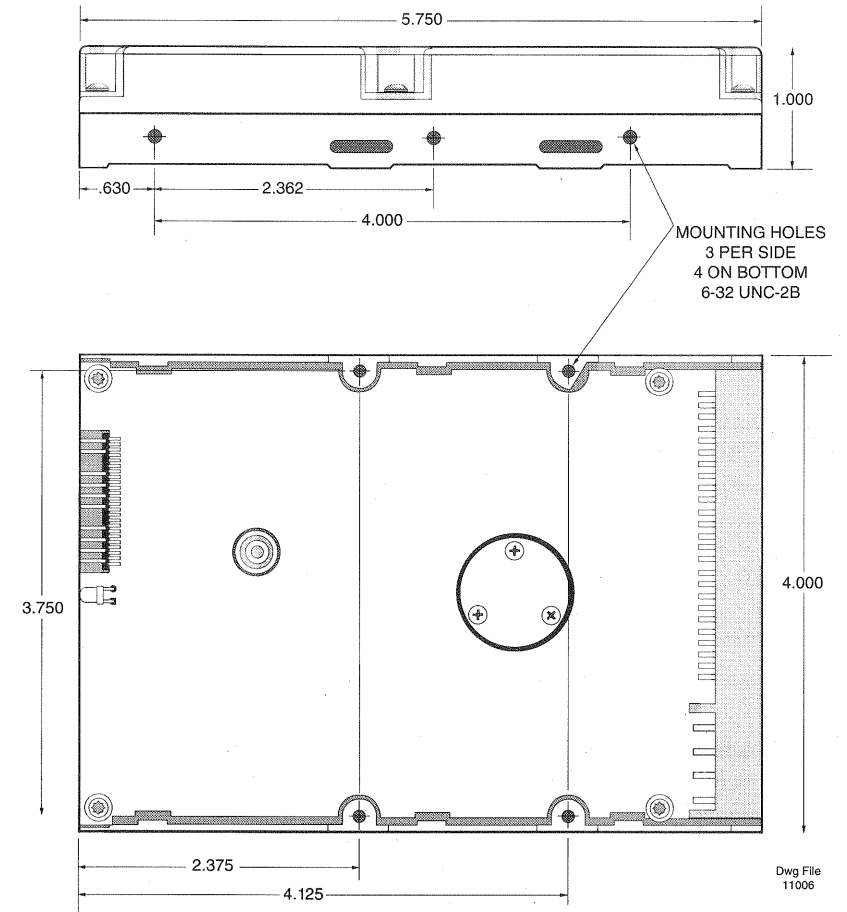
CAUTION: Mounting screws must not penetrate the bottom mounting holes by more than 0.20 inches or the side mounting holes by more than 0156 inches. Screws that are too long may short-circuit PCBA components.

Board Layout Drawing
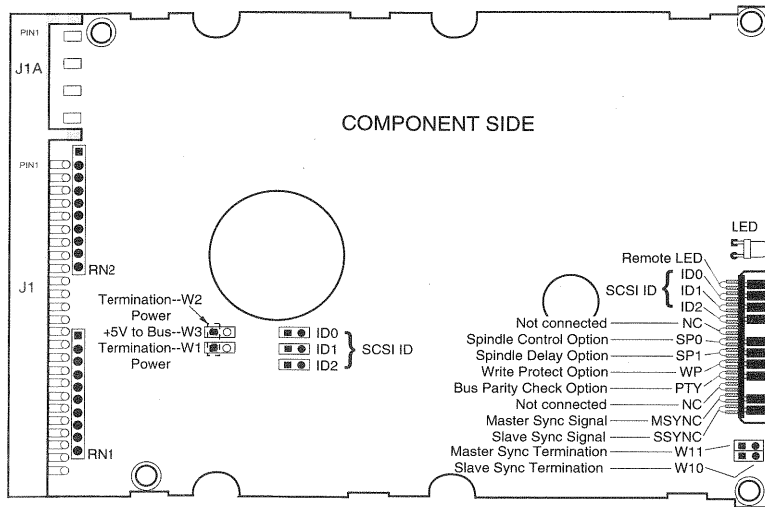
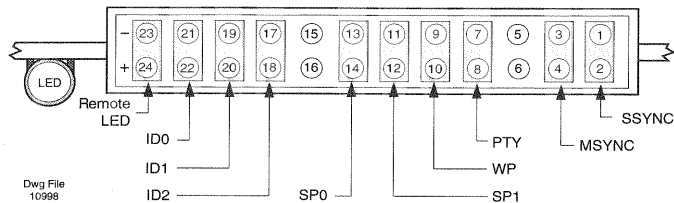### Configuration/Options

• **SCSI Address.** Jumpers at ID0, ID1, and ID2 select the SCSI address. Each SCSI device on one Host Adapter must have a unique address. Note that there are two identical groups of address jumpers (one on the board; the other on the Option Jumper Block). Use either group for address selection but not both at the same time.

SCSI ID	ID2	ID1	ID0	SCSI ID	ID2	ID1	ID0
0	out	out	out	4	in	out	out
1	out	out	in	5	in	out	in
2	out	in	out	6	in	in	out
3	out	in	in	7	in	in	in (Default)

• **Interface Termination.** RN1 and RN2 provide active termination for the SCSI interface lines. (Active termination is recommended when multiple drives are used on the same SCSI cable.) The default is RN1 and RN2 installed. SCSI terminators are installed only in the end devices on the SCSI cable; remove the terminators from each of the other devices. The SCSI Host Adapter card and the last drive in the chain should have terminators.

• **Terminator Power.** W1, W2, and W3 select the source of terminator power (+5V) for interface terminators RN1 and RN2.

W1	W2	W3	
Y			Drive provides power to RN1 and RN2. (Default)
	Y		Host provides terminator pwr via J1 pin 26 to RN1 and RN2.
		Y	Drive supplies +5V to the bus via J1 pin 26.

• **Spindle Options.** Jumpers at SP0 and SP1 control the spindle options.

SP0	SP1	
N	N	The drive starts the spindle motor at power-on. (Default)
Y	N	The drive waits for a Start Unit SCSI command to start the spindle motor.
N	Y	Spindle start-up is delayed based on SCSI ID address (12 seconds per ID)

• **Write Protect.** A jumper at WP selects the write protect option.

Jumper	The drive is write protected.
No Jumper	The drive is not write protected. (Default)

• **Parity.** A jumper at PTY selects the bus parity check option. The drive always generates parity regardless of this option.

Jumper	SCSI interface parity checking disabled.
No Jumper	SCSI interface parity checking on. (Default)

• **Spindle Sync Termination.** Jumpers at W10 and W11 control spindle sync termination. This depends on system configuration; i.e., Master Mode or Master Controller Mode.

W10	W11	
Y	Y	Slave (W10) and Master (W11) Sync are terminated. (Default)
N	N	Spindle sync not terminated.

• **Remote LED.** A user-supplied LED may be connected to Remote LED.

PC Integration

When installing a Micropolis SCSI drive in a PC, the most common method is to run your SETUP program and define *No Drives Present*. The SCSI host adapter will automatically self-configure on power-up. To install the drive, follow the computer or host adapter manufacturer's instructions to use the on-board BIOS routine or software that was supplied with the host adapter.

Remember that the drive is shipped with the SCSI Address jumpered for ID7, to give maximum flexibility in addressing. If your system requires that the drive be set to a different SCSI Address, see page 4 of this document.

UNIX Workstation Integration

Installing a Micropolis drive on most UNIX workstations is easy. In most cases, the DISKTAB (FORMAT.DAT on SUN systems) file must be modified to include an entry describing the drive's geometry. The DISKTAB (or FORMAT.DAT for SUN) is usually contained in the /etc directory, and can be edited using VI or any appropriate text editor. Other systems require no modifications and will auto-configure the drive.

Since each system's requirement is unique, the Micropolis Technical Support Department maintains continually updated listings of the various parameters required for the most popular workstations. This list is also maintained on the Technical Support Bulletin Board and on the Micropolis Forum on CompuServe. Please feel free to contact any of these sources for assistance in installing your Micropolis drive.

SCSI Host Adapter Info

Numerous manufacturers produce SCSI host adapters compatible with Micropolis SCSI disk drives. Among them are the following:

Adaptec
(408) 945-2550
BBS: (408) 945-7727

Always Technology
(818) 597-9595
BBS: (818) 597-0275

American Megatrends
(404) 246-8645

Bustek/Buslogic
(408) 492-9090
BBS: (408) 492-1542

Dist. Processing Tech.
(407) 830-5522
BBS: (407) 831-6432

Data Technology Corp. (DTC)
(408) 262-7700
BBS: (408) 942-4197

Future Domain
(714) 253-0440
BBS: (714) 253-0432

Ultrastor
(510) 623-8955
BBS: (510) 623-9091

Macintosh Integration

All Macintosh models created since and including the MacPlus are compatible with Micropolis SCSI drives. Obviously, space requirements mean that certain drive models will have to be external to certain Macintosh models.

Macintosh Mounting Brackets

In some cases, installation of a Micropolis drive in Macintosh models will require use of special brackets or cable adapters. A typical example would involve intalling a Micropolis full-high 5-1/4" drive inside a Quadra 9xx. Several sources exist for these brackets/adapters, including:

>Questronex
>1050 Calle Negocio, San Clemente, CA 92672
>(800) 432-4392

>UniStor
>45 Parker, Irvine, CA 92718
>(800) 422-2115

>DTI
>8750 Main St., Eden Prairie, MN 55344
>(612) 942-7474

Macintosh Software Installation

To make a Micropolis drive usable on the the Macintosh platform:

1. Install the Macintosh Operating System.
2. Install a Macintosh device driver.
3. Create a Macintosh partition map.

There are many third-party software products commercially available to perform these functions. Some of these products will identify the three functions referenced above as "partition," others as "initialize," and still others as "install disk drive." There is generally no need to "format" the drive. If the drive is "factory fresh" (i.e., unused since it was shipped from the factory), low-level formatting of the drive was already performed at the factory. Most of these software products will automatically set the drive interleave to the proper value; for those that do not, an interleave value of "1" or "1:1" is most often the correct setting.

Recommended third-party software products include, but are not limited to, current versions of:

- Anubis by CHARISMAC Engineering
- Drive 7 by Casa Blanca Works
- Formatter One by Software Architects
- FWB Toolkit or FWB Personal Edition by FWB
- SCSI Director by Transoft
- Silverlining by LaCie
- Spot-On by MacPeak

Micropolis drives conform to the termination requirements detailed in the ANSI SCSI specification governing the appropriate class of Micropolis drive models. The user should be aware of whether the Macintosh model does or does not supply terminator power (TERMPWR) to the SCSI bus, and should be prepared to change the drive's TERMPWR jumper accordingly if the internal drive terminator is used. The drive's default TERMPWR configuration is correct for all Macintosh models except the MacPlus; the MacPlus does not supply terminator power to the SCSI bus.

If the drive is used in an external enclosure and is terminated externally, the user may have to place a jumper on the drive's "+5V to Bus" pins if the Macintosh model does not supply TERMPWR to the SCSI bus. Quadra users should remove the drive's internal terminators (RN1 and RN2) if the drive is installed on the Quadra's internal bus.

System Information

In the unlikely event that you need technical assistance when installing your Micropolis drive, several pieces of information will be helpful.

1. What platform is the drive running under – DOS, Macintosh, Novell, Unix, Sun, Silicon Graphics, Hewlett Packard, etc? What computer system (make and model number)?

2. What version of the Operating system are you running?

3. Is the SCSI host adapter integrated or embedded into the system board? If not, what SCSI host adapter are you using (manufacturer and model number)?

4. What is the model number and part number of the drive that you are installing? This information can be found on the drive's silver and black label.

5. How is the drive physically attached to the system? Are there any additional peripherals on the SCSI bus? Is the drive the last device on the SCSI bus? Where are the terminators located?

6. How are the jumpers set on the drive? Is the drive supplying terminator power?

7. How long is the SCSI cable from one end to the other, including any lengths of cable internal to the enclosure?

When you have assembled this information, contact Micropolis Technical Support (see page 11).

Technical Support

In the United States, for assistance regarding spares, technical training, system integration, or technical problems, contact Micropolis Technical Support at:

Phone:	(818) 709-3325
FAX:	(818) 718-5352
BBS:	(818) 709-3310 (14,400 baud, 8 data bits, no parity, 1 stop bit, full duplex)

International Technical Support:

Reading, England	Munich, Germany
Phone: +44/734-751315	Phone: +49/89-859-5091
FAX: +44/734-868168	FAX: +49/89-859-7018
Paris, France	Singapore
Phone: +33/1-6920-15-18	Phone: +65/482-4191
FAX: +33/1-6011-82-25	FAX: +65/482-4193

(The "+" stands for the appropriate international access code.)

CompuServe®

Users of the CompuServe® Information Service can obtain up-to-the-minute Micropolis product information and technical support from the Micropolis Forum:

• Simply log on to CompuServe® and type GO PCVEND at any "!" prompt

The Micropolis Message Board and library of files are located in Section 5.

If you are not presently a CompuServe member but wish to join, call (800) 524-3388 and ask for Representative #194.

Technical Documentation and Spare Parts

Please call the following number for technical documentation and/or spare parts:

U. S.   (818) 718-5360

Drive Returns

If returning a Micropolis disk drive for any reason, **contact your reseller first.** Often the reseller will be able to resolve the problem in less time.

If returning a drive directly to Micropolis, call Customer Service for a Return Goods Authorization (RGA) number. Micropolis Customer Service can be reached during business hours.

- For North, Central, and South America, call (818) 709-3325
- Northern Europe, call +44 (0) 734 751315 ext 538
- Southern Europe and Africa, call +44 (0) 734 751315 ext 539
- Asia/Pacific, call Singapore +65/480-9447

(The "+" stands for the appropriate international access code.)

Please have the following information available when you call:

1. Serial number (located on the drive's label)
2. Model number (located on the drive's label)
3. Part number (located on the drive's label)
4. Date of purchase

Return your Micropolis disk drive in the original shipping carton. If it is not available, Micropolis will provide one for a nominal fee.

Please print your RGA number clearly on the top of the disk drive shipping container to ensure proper handling at the factory.

Disk Drive Limited Warranty

Micropolis Corporation warrants its disk drives with an unformatted capacity of 380 megabytes or greater to be free from defects in material and workmanship for a period of five (5) years from the date of purchase.

This warranty is subject to the terms and conditions outlined herein.

This Micropolis warranty is for Micropolis disk drives sold to original end-users who purchase qualified products from Authorized Micropolis Distributors and Resellers. It is not transferrable to subsequent owners/users.

During the warranty period, Micropolis (at its option) will repair/replace a Micropolis disk drive that proves to be defective. This will be done at no charge provided that the Micropolis disk drive is, in fact, defective and is returned to Micropolis or an authorized service center in an approved shipping container.

A warranted Micropolis disk drive is to be returned to Micropolis at the purchaser's expense and must be shipped in Micropolis approved packaging. The original carton in which the Micropolis disk drive was received is the preferred shipping container. If it is not available, Micropolis will provide a carton specially designed for shipment of a Micropolis disk drive for a nominal fee.

Micropolis offers an advanced exchange program for a fee whereby Micropolis will advance a drive within 24 hours to our Customers. The Customer provides a security deposit to insure the return of a defective drive. The defective drive is returned in the same carton in which the advanced exchange was received.

After repair by Micropolis or an authorized service center, Micropolis disk drives are warranted for an additional six months or the balance of the original warranty (whichever is greater).