Digital Storage Products

Model RZ73
Model RZ74
Installation Guide

Order Number: EK–RZ73D–IG. B01

Contents

1 Introduction

This manual presents the information needed to configure and install your RZ series disk drive. Before unpacking or handling the drive or attempting any installation, please read through this manual, including all warnings and cautions.

The RZ73 is a full-height 5.25 inch disk drive with a formatted capacity of 2000 megabytes and a single-ended (S) or differential (D) SCSI-2 interface.

The RZ74 is a full-height 5.25 inch disk drive with a formatted capacity of 3570 megabytes and a single-ended (S) SCSI-2 interface.

_____ CAUTION _____

Handle the disk drive with care. Observe antistatic precautions. Static electricity can damage integrated circuits. Always use a properly grounded wrist strap and antistatic pad when removing the disk drive from its antistatic bag and handling it outside the bag.

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## 2 SCSI Address and Options Selections

An option connector on the printed circuit module is used to set the SCSI address and select the various operating options that are described in the following paragraphs. Jumpers are placed across specific pins in the connector to select the desired SCSI address and operating options. The connector and various jumper placements are shown in the figures that follow.

SCSI Bus Address Selection

Three pairs of pins on the option connector are used to set the disk drive's address on the SCSI bus. The drive will accept addresses 0 through 7. Each device on a SCSI bus must be assigned a unique address. Typically the first drive on the bus is assigned address 0, the second drive address 1, and so on. SCSI address 7 is typically reserved for the host adapter.

REAR VIEW

Power Connector   Option Connector

21   1

Note: Pins 21 and 22 on RZ74 only

22
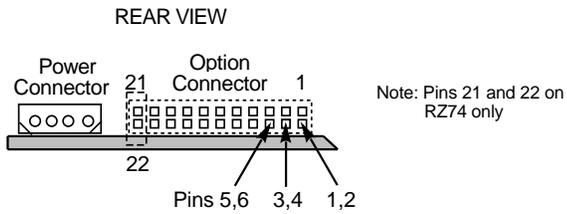
Pins 5,6   3,4   1,2

ID JUMPER SETTINGS		
SCSI ID Pins 5,6	3,4	1,2
0	□ □	□ □	□ □
1	□ □	□ □	■
2	□ □	■	□ □
3	□ □	■	■
4	■	□ □	□ □
5	■	□ □	■
6	■	■	□ □
7	■	■	■

Spin Up Option Selection

When a jumper is installed across pins 13 and 14 of the option connector the disk drive will spin up when power is applied. Without the jumper the drive waits for a START UNIT command before spinning up.

The disk drive spins down when power is removed or when a fault condition is detected.

REAR VIEW

Power Connector   21   Option Connector   1   Note: Pins 21 and 22 on RZ74 only

22   2

Pins 13,14 SPINUP Jumper
■ Spin up when power is applied.

▯ Wait for START UNIT command.

Pins 19,20 FIRMWARE LOAD Jumper
■ Firmware load option enabled.

▯ Firmware load option disabled.
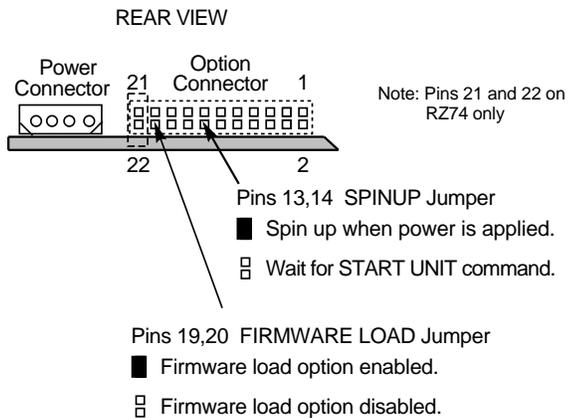
Firmware Load Option Selection

The capability to update the drive's internal flash ROM has been provided to allow firmware updates to be made in the field. In order to update the flash ROM the following steps should be taken:

1. Apply power to the drive.

2. Install the jumper across pins 19 and 20 of the option connector.

3. Load the firmware update.

4. Remove jumper when the update is complete.

Power should NOT be applied to the drive with the jumper installed.

LED Indicator Options Selections

The bottom rear of the disk drive has two surface mounted LED indicators, busy (BSY, green) and fault (FLT, amber). These indicators are operational only when jumpers are installed as described below.

BOTTOM VIEW

Busy (BSY, green) LED
Fault (FLT, amber) LED

(Connector Side)

REAR VIEW

Power Connector

Option Connector

21

1

22

2

Note: Pins 21 and 22 on RZ74 only

Pins 7,8 FAULT LED Jumper

■ Onboard Fault LED enabled.

🬀 Onboard Fault LED disabled.

Pins 9,10 BUSY LED Jumper

■ Onboard Busy LED enabled.

🬀 Onboard Busy LED disabled.
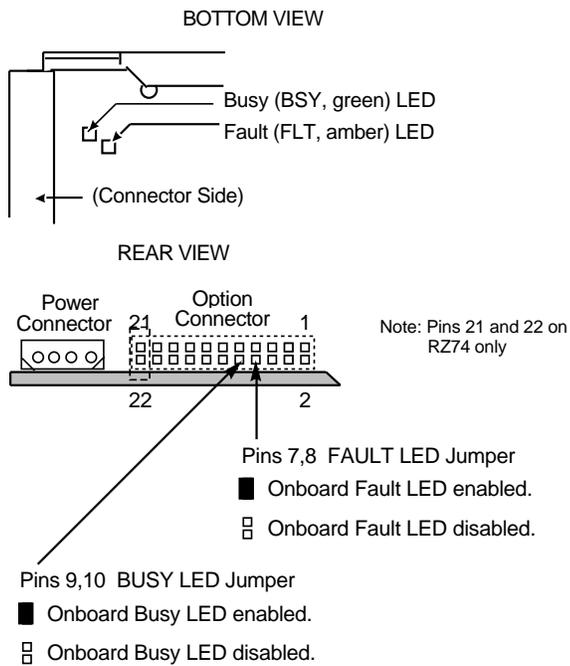
The busy LED indicates that the drive is working on a SCSI command. It is not equivalent to the SCSI BSY signal. The fault LED indicates a drive fault condition. It is normal for both indicators, if enabled by their jumpers, to light briefly upon application of power as a lamp test.

Remote Options

The option connector can be used to remotely control or monitor certain drive functions. When the remote control panel is to be used, jumpers are removed from the option connector and are replaced by a cable(s) to the remote panel. The supported remote options include:

• Selection of SCSI address from external switches, such as on an operator control panel.

• Monitoring busy and fault conditions with external LED indicators instead of those on the drive. (The user must provide external current-limiting resistors to limit the current to 6mA or less. No current limiting resistors are necessary if the LED is rated to handle up to 7 mA maximum.)

> A front bezel with a BUSY LED mounted may have been installed at the factory. The associated cable has to be connected to the option connector in the following manner: black lead to pin 9 and red lead to pin 11.

——————— **Note** ———————

In this case no current-limiting resistors are needed.

_____

• Remote power supply notification to the drive of AC power failure.

If the power supply warns the drive at least 1.0 milliseconds before the voltages become unsafe, the drive will prevent write splices (write interruptions within a data sector). Unsafe voltages levels (measured at the drive connector) are voltages outside the following;

> 4.690 to 5.557 for the +5Vdc supply
> 10.994 to 13.399 for the +12Vdc supply

**The following diagram shows proper connection of
remote options.**

| | **OPTION** | **EXTERNAL USER** |
| **DISK DRIVE** | **CONNECTOR** | **PROVIDED DEVICES** |

+5Vdc out — 11

External *
Current
Limiting
Resistors

Fault LED   Busy LED

FLT_SINK L — 7

BSY_SINK L — 9

ID_0 L — 1

— 2

ID_1 L — 3

SCSI
Address
Switches

— 4

ID_2 L — 5

— 6

AC_LOW L — 12

AC warning circuit.
Logic low on pin 12 indicates
AC failure. 1 millisecond advanced
warning required.
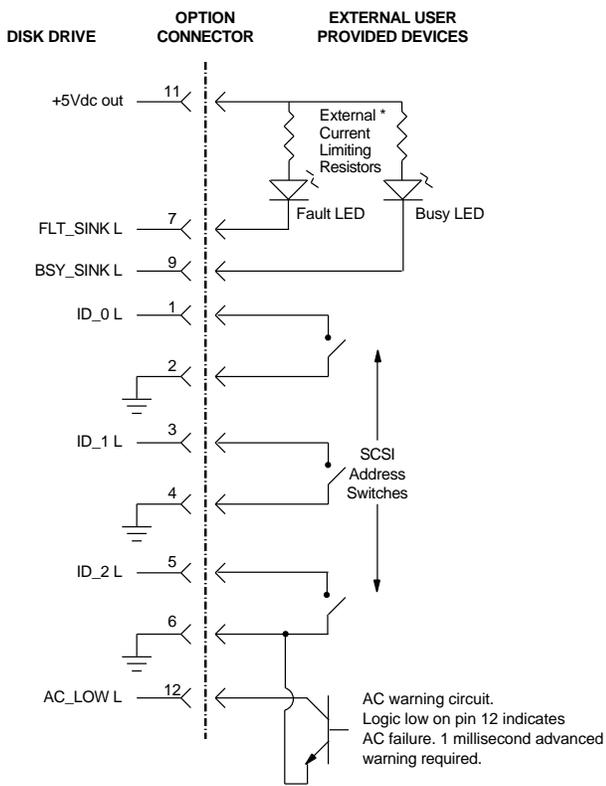
* The 470 ohm current limiting resistors on the
  module are not shown in this drawing.

7

Spindle Synchronization Option (RZ74 only)

Spindle synchronization for the RZ74 is enabled by the installation of a daisy-chain cable from drive to drive. This cable should connect pin 21 to the daisy-chained SPINDLE_SYNC_REF SIGNAL, using pin 22 as its ground reference.

REAR VIEW

Power
Connector   21   Option
            Connector   1

22   2

Pins 21,22 SPINDLE SYNC Cable
■ Spindle Sync Reference is enabled

⊟ No connection to Spindle Sync Reference
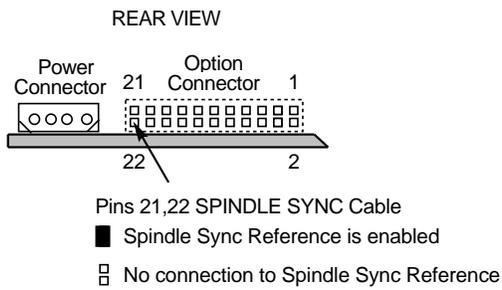
3 SCSI Bus Termination

RZ73 Termination

The RZ73 disk drive can provide terminator power
to its own termination resistor packs (if installed)
and/or to the SCSI bus. Alternatively, the drive's
termination resistor packs can be powered from
the SCSI bus. The figure below shows the proper
jumper arrangements for each terminator power
configuration.

In all cases, the drive's termination resistor packs are
to be installed ONLY if the drive is at the end of the
SCSI bus.

REAR VIEW

Power Connector   Option Connector

19   1

Pins 17,18

Pins 15,16

2

Pin

17   15
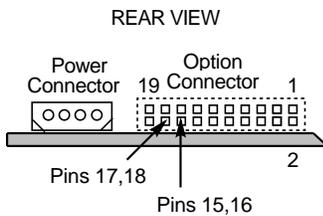
☐   ☐   No drive power provided to SCSI TERMPWR.

☐   ☐   No power to drive terminator resistor packs..
          Resistor packs must be removed.

■   ☐   Drive provides termination power to the drive's
    ☐   terminator resistor packs (if installed).

☐   ■   SCSI bus provides termination power to the drive's
☐   ■   terminator resistor packs (if installed).

■   ■   Drive provides termination power to the drive's
          terminator resistor packs (if installed) and to SCSI bus.

The following figure shows the proper placement of
the termination resistor packs on the drive module.

Resistor Packs

BOTTOM VIEW

SCSI Connector

Pin 1
Designation

Pin 1 designation on the
resistor packs are usually
a "dot" or a "vertical bar".

Pin 1
Designation

Pin 1
Designation
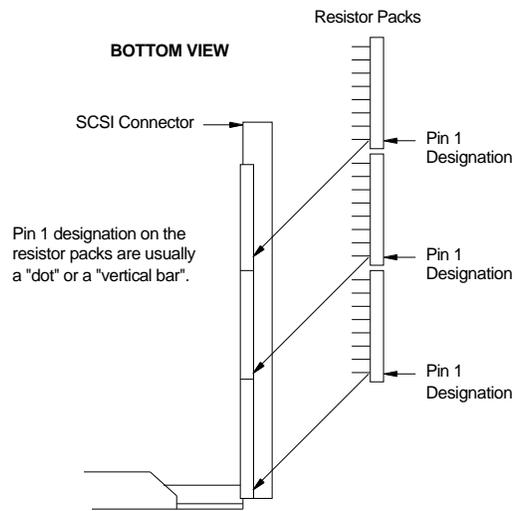
RZ74 Termination

The RZ74 disk drive is capable of supplying termination power to the SCSI bus, as well as providing active termination to the bus. The RZ74 drive does not use removable resistor packs for termination. The figure shows the proper jumper arrangements for each terminator power configuration.

Active termination should be enabled ONLY if the drive is at the end of the SCSI bus.

REAR VIEW

Power Connector   Option Connector
          21   1

Pins 17,18

Pins 15,16
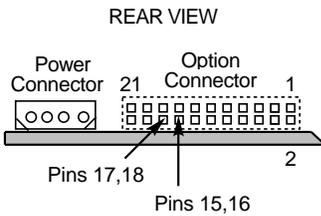
Pin
17 15

□   □   SCSI TERMPWR is NOT provided by the drive.

□   □   Active termination is DISABLED.

■   □   SCSI TERMPWR is NOT provided by the drive.

     □   Active termination is ENABLED. (drive at end
          of SCSI cable)

□   ■   TERMPWR is provided to SCSI bus by the drive.

□   ■   Active termination is DISABLED.

■   ■   TERMPWR is provided to SCSI bus by the drive.
          Active termination is ENABLED. (drive at end
          of SCSI cable)

4 Power Connections and Requirements

Each disk drive requires +5 and +12 volt DC which is supplied from an external source by means of the 4-pin power connector of the drive.

REAR VIEW

Power Connector

Option Connector

21   1

Note: Pins 21 and 22 on RZ74 only

22   2

Pin 1   4

Power Connector

Pin 1 +12VDC
Pin 2 Gnd (+12V Return)
Pin 3 Gnd (+5V Return)
Pin 4 +5VDC
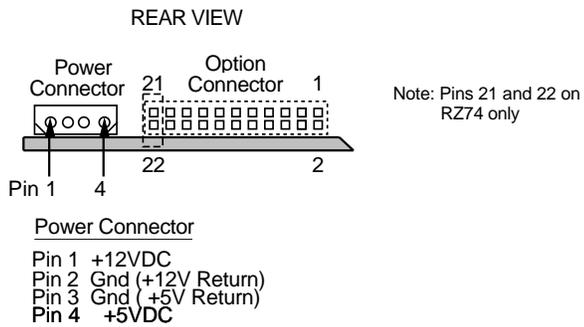
**Voltage &
Regulation:**

	+5VDC	+12VDC
RZ73	±5%	±5% (±6% during spin-up)
RZ74	±5%	±5% (±5% during spin-up)

**Ripple &
Noise:**

	+5VDC	+12VDC
RZ73	<100mv p-p	<200mv p-p
RZ74	<75mv p-p	<150mv p-p

Current:

+5VDC Current	Typical	Maximum
RZ73	1.0A	1.2A
RZ74	1.0A	1.2A

+12VDC Current	Typical	Maximum
Spin-up	4.3A	5.0A
Spinning—no seeks	1.0A	1.2A
Continuous random seeks	1.5A	1.8A

Power:

| Total power with continuous random seeks	Typical	Maximum
RZ73	22.9W	28.4W
RZ74	35.0W	40.8W

5 Mounting

The disk drive may be mounted in any orientation.
Allow 0.10 inches clearance between the HDA and all
adjancent surfaces, and sufficent slack in all cables,
to provide for motion of the drive on its shock mounts
relative to the drive frame.

The drive is mounted with four 6-32 screws. The
mounting screws should not exceed more than 0.02
inches beyond the inside surface on the drive frame.

────────────── **CAUTION** ──────────────

Screws longer than necessary will defeat the
shock mounting and could damage the drive.

RF73/RF74 MOUNTING HOLES (Side View)

warranty

1.460
.860
3.120
.970
4.740

RF73/RF74 MOUNTING HOLES (Bottom View)

5.500
3.120
2.050
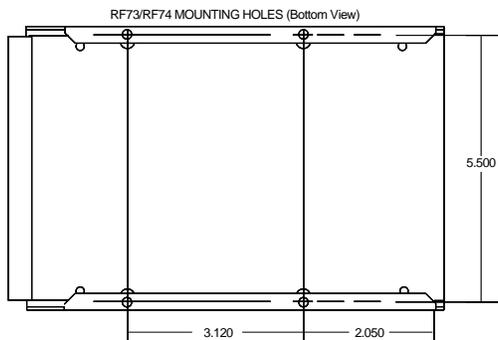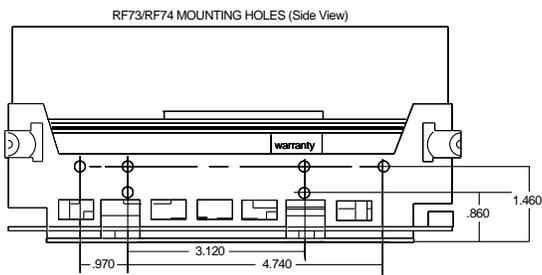
6 Summary of Specifications

RZ73/RZ74

Single–Ended SCSI 50–Pin Connector Pin Assignments

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
2	–DB (0)	16	–DB (7)	30	GROUND	42	–MSG
4	–DB (1)	18	–DB (P)	32	–ATN	44	–SEL
6	–DB (2)	20	GROUND	34	GROUND	46	–C/D
8	–DB (3)	22	GROUND	36	–BSY	48	–REQ
10	–DB (4)	24	RESERVED	38	–ACK	50	–I/O
12	–DB (5)	26	TERMPWR	40	–RST		
14	–DB (6)	28	RESERVED				

Notes:
1. All odd numbered pins (except pins 23,25,27) must be connected to ground.
2. Pin 25 should be left open.
3. Pin 26 (SCSI_TERMPWR) is reserved for terminator resistor power source.
4. The minus sign indicates an active low signal..

Disk Drive Functional Specifications		
	RZ73	**RZ74**
Interface	SCSI–2	SCSI–2
Formatted storage (Mbytes)	2,000	3,570
Average seek time (ms)	12.9	12.0
Bits per inch (max.)	43,880	50,500
Tracks per inch	2,432	2,756
Tracks per surface	2,620	2,570
Surfaces per drive	21	25
Sectors per track	71	119
Sector capacity (bytes)	520	512–520
Transfer rate (to/from media – Mbytes/s)	2.2	6.9
Transfer rate to bus (synchronous – Mbytes/s)		
Normal mode	5.0	5.0
Fast mode	10.0	10.0
Rotational speed (RPM)	3,600	5,400

Environmental Specifications	
Ambient temperature	
Operating	10C to 50C(50F to 122F)
Nonoperating	−40C to 66C(−40F to 151F)
Maximum wet bulb (noncondensing)	
Operating	28.0C(78F)
Nonoperating	46C(115F)
Relative humidity	
Operating	10% to 90%
Nonoperating	8% to 95%
Altitude	
Operating	2,500m (8,000 ft)
Nonoperating	4,878m (16,000 ft)