MD400 Scanner Pocket Service Guide

Order Number EK-MD400-MC-001

Digital Equipment Corporation

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About This Guide

This pocket service guide provides information for installing and servicing the MD400 scanner.

If you have any comments about this document, please contact CSSE Solent, for attention of G. Georgiou @SBP.

1 INTRODUCTION

1.1 General

The MD400 scanner is a resale of the Ricoh IS50 Image scanner. It is available in 120 Volt and 220-240 Volt variants.

It has an embedded SCSI interface port for connection to a VAXstation computer, and a parallel interface port for connection to a DECstation PC. You must use the appropriate SCSI or PC interface kit option. The personal computer (PC) interface kit includes the Ricoh ISI-8 PC interface card which must be installed in the DECstation backplane.

The Ricoh DF60 automatic document feeder (ADF) is available as a separate option.

1.2 Hardware Options

The hardware options are shown in Table 1.

Table 1 Hardware Options

Digital Option	Description	Vendor Part Number	Vendor
MD400-AA	IS50 Image scanner 120v	IS50	Ricoh
MD400-A3	IS50 Image scanner 220-240v	IS50	Ricoh
MD40X-DF	DF60 Automatic document Feeder	DF60	Ricoh
MD400-BA	MD400-AA + MD40X-DF	IS50+DF60	Ricoh
MD400-B3	MD400-A3 + MD40X-DF	IS50+DF60	Ricoh
MD40X-SK	SCSI Interface Kit (VAXstation)	-	-
MD40X-PK	PC Interface Kit (DECstation PC)	ISI-8	Ricoh
MD40X-LA	Replacement Lamp	H2045018	Ricoh

1.3 Software Options

The software options are shown in Table 2.

Table 2 Software Options

Description	VAX	PC	Vendor
DECimage Scan Software V2.1	Yes	No	Digital
ProImage V3.10 For Digital MD400	No	Yes	Software Dynamics GmbH
MS-Windows V3.0	No	Yes	Microsoft
MS-DOS V3.1 or higher	No	Yes	Microsoft

1.4 Product Documents

The documents shown in Table 3 are available in TIMABOX.

Table 3 Product Documents

Digital Part Number	Title	Order From (available July 1991)
EK-MD400-MC-001	MD400 Scanner Pocket Service Guide	P&CS Northboro MA
EK-MD400-UG-001	MD400 Scanner User Supplement	ESSB Galway

1.5 System Configurations

1.5.1 PC Environment (Parallel Interface)

- Hardware
  - DECstation 220, 316, 320, 325, 425.
    Minimum: 2Mbyte Memory, 20 Mbyte hard disk, mouse, EGA video.
    Must have a spare backplane slot for interface card.
    Interrupt Request, IRQ2 or IRQ3 must be free.
  - MD400-AA for 120v
    or
    MD400-A3 for 220-240v operation.
  - MD40X-PK
- Software
  - ProImage V3.10 For Digital MD400 scanner.
  - MS-Windows V3.0 or later.
  - MS-DOS V3.1 or higher.

1.5.2 VAX Environment (SCSI Interface)

- Hardware
  - VAXstation 3100 Models 30, 38, 40, 48, 76.
    Minimum 16Mbyte main memory.
  - MD400-AA for 120v
    or
    MD400-A3 for 220-240v operation .
  - MD40X-SK.

- Software
  - DECimage Scan Software (DSS) V2.1.

2 INSTALLING THE SYSTEM

2.1 Before Installation

The MD400 hardware and software is customer installable. Digital will install the option for an additional charge.

Before attempting to install the scanner, identify the following:

- All system components for a supported configuration are on site
- A suitable location for siting the scanner/system (Refer to the next paragraph)
- A suitable location for unpacking the equipment.

Check for the following when choosing a suitable location to install the system:

- Scanner shielded from direct sunlight at all times of day
- Scanner away from high temperature, humidity and vibration
- Scanner away from excessive dust or corrosive gases
- Power cord will reach the power outlet, without causing obstruction
- Interface cable will reach the computer, without causing obstruction
- Desk top flat, level, stable and can adequately support weight and size of the scanner and the computer (Refer to Table 4).

The physical characteristics of the scanner and the ADF are shown in Table 4.

Table 4 Physical Characteristics

Characteristic	Value
Height	300 mm 625 mm with ADF in highest position
Width	390 mm
Depth	610 mm, including space for cables
Weight	Scanner: 12 Kg ADF: 5 Kg
Temperature	5 to 35 °C
Humidity	30 to 85 %
Length of cables supplied in SCSI interface kit	1 metre
Length of cable supplied in PC Interface Kit	2 metres
Length of power cord supplied with scanner	2.5 metres

2.2 Installation

1. Take unopened cartons to the area previously identified for unpacking.
2. Check packaging for shipping damage and report any damage found.
3. Unpack and check for short shipments (refer to IS50/DF60 User Manuals).
4. Retain packing materials. These will be needed for service.
5. Place equipment in the location previously prepared for installation.

6. Read the installation procedures in the IS50/DF60 User Manuals.

   NOTE
   The power cord is shipped as a separate line item, not with the scanner (as shown in the IS50 User Manual).

7. VAXstation users should halt the system and use the console command:-

   ```
   >>> SHOW DEVICES
   ```

   to display the current status of SCSI IDs.

   Determine and note a suitable SCSI ID for the scanner; an ID of zero is recommended if available.

8. Switch off the power to the system box and all peripherals.

   WARNING
   Before connecting or disconnecting interface cables, remove power from the scanner, the host computer and any other devices connected to the SCSI bus.

   WARNING
   A special interface cable is supplied in the PC interface kit. Do not use any other cable for this purpose as this may severely damage equipment.

9. Install the interface kit to connect the computer to the scanner as follows:

   - VAXstation - I/F cables and terminator, refer to the 3100 User Manual.
   - DECstation - I/F card and cable, refer to the ISI-8 Installation Manual.

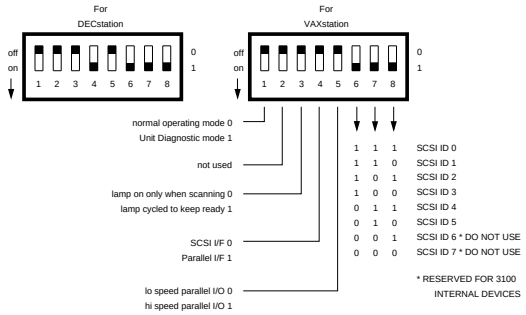

Figure 1 DIP Switch Setting For Normal Operation

10. Set the DIP switch on the rear panel as shown in Figure 1.

    NOTE

    Use DIP switches 6,7 & 8 to select the SCSI ID previously noted.

11. Install the ADF if required (refer to DF60 User Manual).

    CAUTION

    Remember to unlock the carriage lock on the scanner.

12. Power up the scanner and check the self-test completes successfully. The indicators light as shown in Table 5 for successful completion.

Table 5 Indicators

SCANNER	
RED	GREEN
off	on

13. If indicators are lit as in step 12 the hardware installation is complete. Go to step 15.

14. Switch the power off. Check that the installation has been carried out correctly. Repeat or check steps 8 to 12.

    If there is still an error, refer to Section 3.

15. Install the software if required (refer to the ProImage or DSS manuals).

2.3 Post-Installation Checks - Verification

When the hardware and software has been installed, it is recommended that a document is scanned to check the system is functioning correctly. Beware that image defects in printed hardcopy may be due to limitations of the printer rather than the scanner.

If the performance of the printer is in doubt, use a VDU output device to check the quality of a scanned image. Ask the customer to perform the scan, or refer to the DSS or ProImage Software User Manuals for help.

Ask the customer to retain the original shipping packaging on site. Explain that it is the user's responsibility to carry out preventive maintenance and lamp replacement and point out these details in the Users Manuals.

3 TROUBLESHOOTING

3.1 VAXstation Software

DECimage Scan Software (DSS) is a fully Digital supported software product. Refer to the relevant product service documentation.

3.2 PC Software

ProImage is supported directly by the vendor, Software Dynamics GmbH. The vendor provides a registration card which the user must complete and return to the vendor. This permits the user to contact the vendor by telephone or FAX and get help with ProImage software:

SOFTWARE DYNAMICS GmbH (Germany)

```
Contacts : Mr Thomas Deharde
           Mr Dick Dirks
           Mrs Sharon Dirks
           Phone: 49-0421/32 04 61
           FAX  : 49-0421/32 61 35

       Business hours: 09.00 to 17.00
       (local time) Monday to Friday
```

3.3 Shading Correction

If the symptoms are uneven shading, cycle the power on/off and re-scan.

NOTE

It is necessary for the scanner power to be periodically cycled in order for the correction to be fully effective.

The MD400 incorporates shading correction to compensate for the effects of:

- Uneven illumination
- Uneven sensitivity of CCD elements
- Uneven lens characteristics
- Effects of ageing.

The correction is done by using data stored in a correction memory. Data is automatically acquired in the correction memory on power-up, by reading a plain white tape which is built into the scanner.

3.4 Hardware Service Strategy

Localise the fault using built-in tests and replace the defective field replaceable unit (FRU). Refer to Section 4 for the FRU list.

3.5 Service Features

- Indicators: Red and Green on the scanner front panel. Green on ADF. Each indicator can show three conditions: on, off, blink.
- DIP switches: Located on the rear panel (refer to IS50 User Manual).
- Built-in tests:
  - Self-tests
  - Unit diagnostics.

3.6 Self-Tests

The Self-Test is invoked at power-on. A lamp test is performed during the time that the self-tests are running; the indicators are switched on for approximately 4 seconds.

If the lamp test fails, check the electrical supply and follow the troubleshooting procedure in the IS50 User Manual.

At completion of the self-tests or if an error is detected during normal operation, the indicators display the error as follows as shown in Table 6. The indicator display are those at completion of the self-tests or errors encountered during normal operation.

Table 6 Indicator Displays

Indicators		
RED	**GREEN**	**Description**
OFF	**ON**	**NO ERROR**
ON	**ON**	**Power/ROM/RAM error[1]**

1. Run unit diagnostic test 1.

ON	**BLINK**	**Illumination error**

1. Cycle power, correct shading.
2. Replace lamp.
3. Cycle power to run self-test.
4. Failing? Swap scanner.

BLINK	**BLINK**	**Optical system error**

1. Cycle power, correct shading.
2. Replace lamp.
3. Cycle power to run self-test.
4. Failing? Swap scanner.

[1]This status also occurs during normal operation when the scanner is “busy”.

Table 6 (Cont.) Indicator Displays

Indicators		
RED	**GREEN**	**Description**
ON	**OFF**	**Driving system error**

1. Swap scanner.

BLINK	**OFF**	**ADF residual paper error**

1. Remove paper inside ADF.
2. Cycle power to run self-test.
3. Run unit diagnostic test 4.

3.7 ADF Faults

You can check the operation of the ADF by loading the ADF with paper and running unit diagnostics test 4.

3.8 Unit Diagnostics

CAUTION

Note the DIP switch settings used for normal operation before starting unit diagnostics. Reset to the original setting when returning the unit to normal operation.

Tests may be selected and controlled from the DIP switches on the rear panel, as shown in Figure 2.

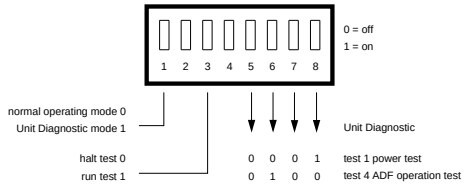

Figure 2 DIP Switch Setting in Diagnostic Mode

Running the unit diagnostics is described in Table 7.

Table 7 Diagnostics

Step	Action	Indicators	
		RED	GREEN
1	Note the DIP switch settings used in normal operation		
2	Turn power switch OFF		
3	Set DIP switch 1 ON, to enable diagnostic mode		
4	Turn power switch ON	BLINK	ON
5	Set DIP switch 1 OFF	BLINK	BLINK
6	Set DIP switch 1 ON	BLINK	BLINK
7	Select the test number, using DIP switches 5 to 8		
8	Run selected test by setting DIP switch 3 ON		

Table 7 (Cont.) Diagnostics

Step	Action	Indicators	
		RED	GREEN
9	To interpret error, check the status of the indicators shown in Table 8		
10	Set DIP switch 3 off to halt the selected test		
11	Wait for current test to terminate	ON	BLINK
12	To run another Unit test, go back to step (7)		
13	When Unit Diagnostics testing is complete, switch off power and RESET DIP switches to original positions for normal operation. After repairing the MD400 system, perform the Post-Installation Checks		

Table 8 Unit Diagnostics Tests

Indicators		Action
RED	**GREEN**	
1. Power Supply Test		
ON	OFF	NO ERROR
BLINK	OFF	Invalid test. Check Step 7 in Table 7.
ALL OTHER		Swap Scanner
4. ADF Operation[2]		
ON	OFF	NO ERROR
BLINK	OFF	Invalid test. Check Step 7 in Table 7.
ALL OTHER		• Remove paper jams. • Remove debris. • Switch off the power and swap the ADF.

[2]Load the ADF with paper to check ADF operation using test 4.

If the PC interface card has been replaced, ensure that the jumper settings are correct, by checking against the original.

4 SPARES LIST

Table 9 FRU List

Part Number	Description
MD400-AA	IS50 SCANNER 120v
MD400-A3	IS50 SCANNER 220-240v
MD40X-DF	DF 60 ADF FOR MD400-AA/MD40X-A3
MD40X-LA	FL LAMP (consumable item, customer replaced)
MD40X-PK	30-35437-01 PC INTERFACE KIT

Table 10 MD40X-SK SCSI Interface Kit FRUs

Part Number	Description
17-02008-01	3 ft SCSI cable
17-01351-01	3 ft IEEE EA end
12-30552-01	Connector, SCSI terminator

Table 11 Power Cords

Part Number	Option	Power Cord, 10 amp
17-00209-15	BN26B-2E	UK/Ireland
17-00210-13	BN24T-2E	Switzerland
17-00310-08	BN19K-2E	Denmark
17-00364-18	BN19Z-2E	Italy
17-00199-21	BN19W-2E	Central Europe
17-00606-02	BN19P-1K	USA/Canada/Japan
17-00198-14	BN24R-2E	Australia/New Zealand
17-00457-16	BN22P-2E	Israel
17-00456-16	BN22Z-2E	India/South Africa

5 TECHNICAL TIPS

Appearance of SCSI scanner to a workstation

```
>>> SHOW DEVICE

VMS ULTRIX
JKA0: ... A/1/0/00  SCAN  xxGB  FX  IS50
```

The device will appear as “JKB0:” on dual SCSI machines. The “capacity” field (xxGB above) changes depending on bus configuration.

The relevant part of the “test 50” screen is:

```
SCSI-A 0E0E.0001 V1.3
FFFFFF05 06000001 00000001 00000001
FFFFFF05 FFFFFF05 FFFFFF03 FFFFFF05
```

5.1 Voltage Selection

The difference between MD400-AA and MD400-A3 is the internal switch setting on the power supply. Do not change this.

5.2 Limitations of SCSI Configurations

There is a limitation on the length of cable which may be used to connect SCSI devices. The maximum allowed length is 6 metres, which includes bus stub lengths within the expansion boxes. In order to meet this requirement, the total length of cable on a single SCSI bus should not exceed 4 metres.

6 FURTHER INFORMATION AND HELP

Further MD400 information is in the MD400 PSP, PASS record 5734 and ProImage PSP, PASS record 3049. The Support organisation have access to a detailed level of product information. Please contact your local centre for help.