INDUSTRIAL PRODUCTS

digital

DPM01 DECdataway
terminal multiplexer
user's guide
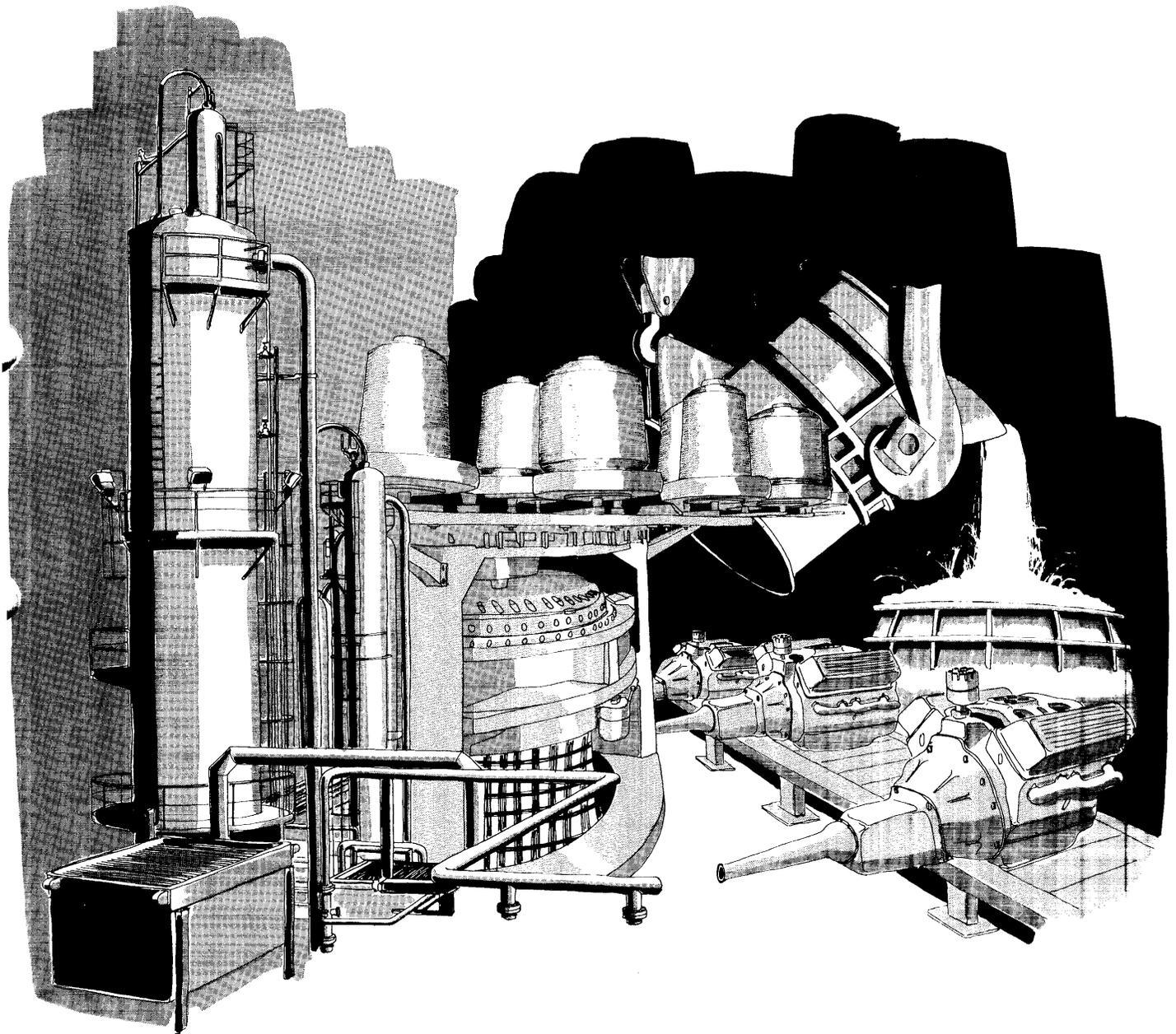
DPM01 DECdataway
terminal multiplexer
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This document was set on DIGITAL's DECset-8000 computerized typesetting system.

CONTENTS

FIGURES

CHAPTER 1
GENERAL INFORMATION

1.1 PURPOSE AND USE
This document provides information pertaining to the installation, use, and maintenance of the DPM01 DECdataway Terminal Multiplexer.

## 1.2 SUPPORT DOCUMENTS
The following support documents are required:

DPM Terminals System Application Programmer's Manual	No. AA-C878A-TC
DECdataway User's Guide	No. EK-ISB11-UG
DPM01 Maintenance Print Set	MP00588

1.3 GENERAL DESCRIPTION
The DPM01 is a microprocessor-based peripheral interface device which provides four logically and physically separate ports for connecting serial I/O devices to a DECdataway. Either a 20 mA current loop or an EIA RS232-C interface may be used on these ports. As part of a Distributed Plant Management (DPM) System, the DPM01 may be used both as a remote electrical interface and as a data preprocessor for interactive terminals such as a DEC LA36 or VT52. When used as a preprocessor, the DPM01 assumes the task of servicing character interrupts and of performing functions normally done by a software terminal driver. Use of the DPM01 is not limited to ASCII terminals; the wide range of terminal attributes which can be accommodated and the transparency modes allow the DPM01 to function as a data communications interface between a DPM host and many UART-compatible serial data I/O device. The *DPM Terminals System Applications Programmer's Manual* should be consulted to determine the full range of DPM01 applications.

In keeping with the reliability, availability and maintainability objectives of the DPM Systems, the DPM01 has no switches or jumpers which require setting, thus unit swapping can be readily done without regard to the DPM system configuration. All necessary information is contained either in the form of jumpers in the connectors which attach to the DPM01 or is down-line loaded from the host processor. Figure 1-1 shows a typical DPM01 application in a DPM System.

The DPM01, shown in block diagram form on Figure 1-2, contains a microcontroller module and two interface modules plus a power supply. All of the components are housed in a rugged industrial type cabinet which is intended for wall mounting.
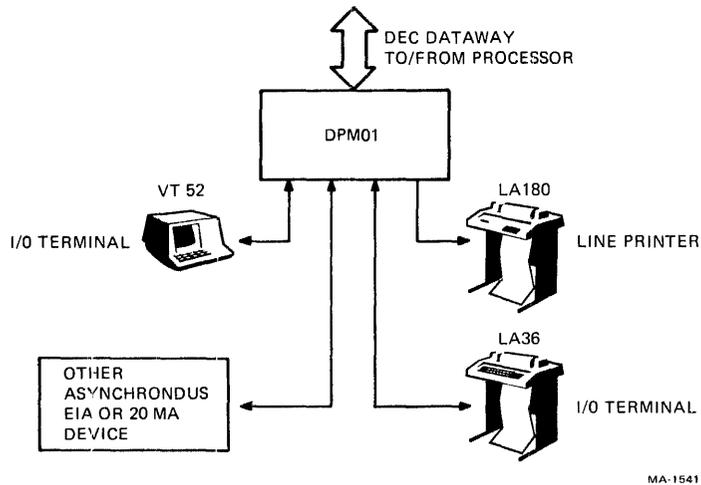
Figure 1-1   Typical DPM01 Application Block Diagram
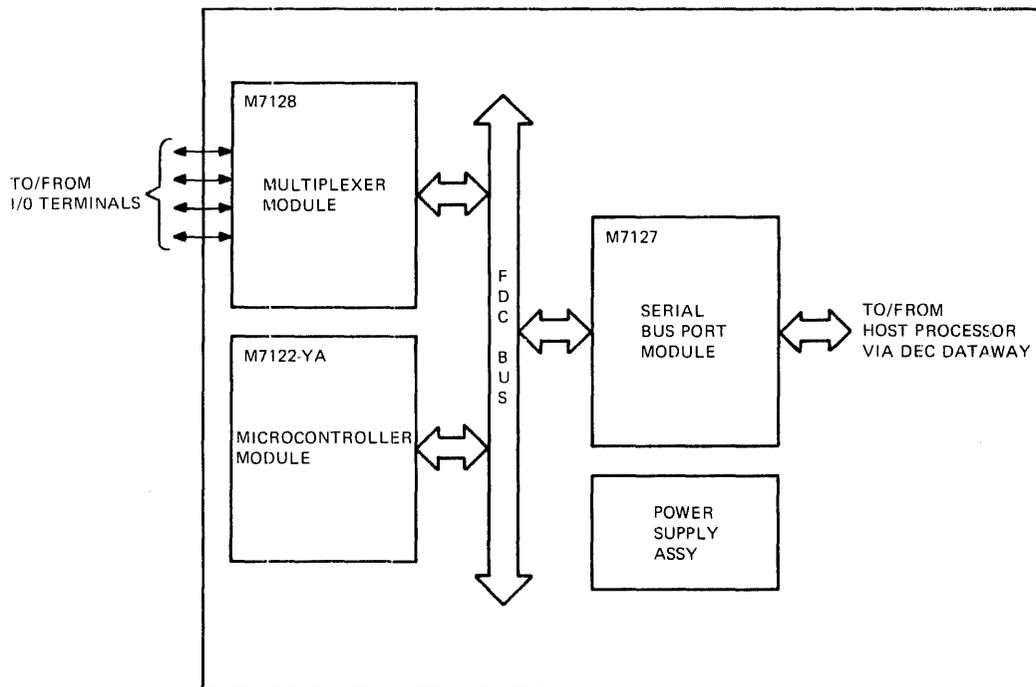
Figure 1-2   DPM01 Block Diagram

The microcontroller module contains a microprocessor and the ROM-resident programs which operate the DPM01 and perform diagnostic testing when a maintenance mode is selected. The two interface modules handle the communications paths between the DPM01's associated terminals and the DPM host processor. Normally, the operation of the DPM01 is controlled by the host processor, thus there are no operator's controls required. Every time the DPM01 is plugged in, the microcontroller runs a series of resident diagnostic programs to ensure that the DPM01 is operating correctly. After the test routine has been successfully completed, the DPM01 goes on line to the host processor via the DECdataway. The host processor then runs a program which down-line loads the DPM01 to set the appropriate terminal characteristics for each port. When the DPM01 is operating, the terminals communicate with the microcontroller module which handles all of the terminal service routines (echoing, character deletion, character recognition, etc.) A message buffer is also set up by the microcontroller and data is stored in the buffer until an appropriate termination character is received (e.g., a carriage return) at which time the data is reformatted into a message and sent via the DECdataway to the host processor. In a similar manner, communications from the host to the DPM01's terminals are reformatted and transferred to the terminals by the microcontroller.

Figure 1-3 shows how a DPM system might be configured with several DPM01s installed on a DECdataway. With the arrangement shown, the following address scheme could be used:

0	System broadcast address; not wired into any connector
1–4	Reserved for Field Service use. Address 1 wired to 1 connector per FDM Addendum.
5	DPM01 #1 port 0 address; wired into connector
6–8	DPM01 #1 ports 1–3 addresses; not wired into any connector
9	DPM01 #2 port 0 address; wired into connector
10–12	DPM01 #2 ports 1–3 addresses; not wired into any connector

No DPM01 DECdataway connector should be wired for an address greater than 60 decimal (74 octal) otherwise one or more of the ports of that DPM01 will fall outside the addressing range of the DECdataway.

1.4 SPECIFICATIONS
The specifications of the DPM01 are given below:

Electrical

Line voltage:	115 Vac ± 10% or 230 Vac ± 10% nominal
Power Line Frequency:	50–60 Hz nominal
Input Current:	2 A (surge) @ 115 V
	1 A (surge) @ 230 V
	1/2 A (typical) @ 115 V
	1/4 A (typical) @ 230 V
Power Dissipation:	45 W
Fuse:	3 A fast blow

HOST
DPM
SYSTEM

DEC DATAWAY
(UP TO 63 ADDRESSES)

OTHER ADDRESSES

ADR 5

ADR 9

DPM01
NO. 1
PORTS

| 0 | 1 | 2 | 3 |

DPM01
NO 2
PORTS

| 0 | 1 | 2 | 3 |

DPM01
OR
RT8XX

DEC DATAWAY
ADDRESS
5

DEC DATAWAY
ADDRESS
8

DEC DATAWAY
ADDRESS
9

DEC DATAWAY
ADDRESS
12

DEC DATAWAY
ADDRESS
6

DEC DATAWAY
ADDRESS
7

DEC DATAWAY
ADDRESS
10

DEC DATAWAY
ADDRESS
11

NOTE: NO DPM01 DEC DATAWAY
CONNECTOR SHOULD BE WIRED FOR
AN ADDRESS GREATER THAN
60_{10} (74_8)

MA-1545

Figure 1-3 Typical DECdataway Addressing Scheme Using DPM01s

Environmental

Ambient Operating Temperature Limits:	5° to 50° C (41° to 122° F)
Ambient Non-Operating Temperature Limits:	–40° to 66° C (–40° to 151° F)
Humidity Limits:	10% to 95%, wet bulb @ 32° C (90° F)

Physical

Height:	34.0 cm (13 3/4 inch)
Width:	39.4 cm (15 1/2 inch)
Depth:	27.3 cm (10 3/4 inch)
Weight:	15 kg (35 lbs)
Mounting:	Wall

Terminal Interface:

Data Rate:	50–9600 Baud
Data Format:	Asynchronous 1 start bit, 5 to 8 data bits, 1 to 2 stop bits.
Level:	20 mA neutral current loop (active or passive) or EIA RS-232 C (Signals AA, AB, BA, BB; CCITT V. 24 signals 101, 102, 103, 104).

1.4.1 Controls and Indicators

Key Switch	3-position mode switch; NORMAL, MAINT, SUPV
	MAINT position used for diagnostics. SUPV position used for special maintenance features.

Indicators

POWER	Indicates that the 5 V power supply is operating
PORT 0 READY	Indicates the status of Port 0
PORT 1 READY	Indicates the status of Port 1
PORT 2 READY	Indicates the status of Port 2
PORT 3 READY	Indicates the status of Port 3

2.1 GENERAL

This chapter contains the information required to unpack, inspect, install, and test the DPM01. Prior to user installation of the DPM01, DEC Field Service organization personnel shall have performed an acceptance procedure to ensure that all warranted equipment is operational after delivery. Upon completion of this procedure, the equipment is installed by the user and connected to the DECdataway.

The physical installation of the DPM01 consists only of mounting the equipment and connecting power and data cables to the external connectors; there are no internal jumpers or switch settings required. Device addresses on the DECdataway are determined by jumpers in the DECdataway connector. The DPM01 assumes that its ports occupy consecutive addresses beginning with Port 0 which is the address wired into the connector.

Each DPM01 is shipped with four sets of cable connectors and pins so that cables can be fabricated for use with terminals having either a male 8-pin Mate-N-Lok connector or a male 25-pin EIA style connector. The connections for the terminals and the DECdataway are made through five 16-pin connectors on the lower rear portion of the unit. Two prefabricated cables are also available; a BC41B 9 m (35 ft) EIA null modem cable and a BC41C 30 m (100 ft) current loop (DPM01 active) cable.

Terminals operated in the current-loop interface mode may have cable runs of up to 600 meters (2000 feet) between them and the DPM01. The actual distance permissible will vary, depending on the data rate and local noise conditions. The figures given in Table 2-1 may be used as a guide in determining the approximate maximum cable runs permissible for the installation. The cable recommended is three 22 AWG twisted pairs individually shielded (Belden No. 8777, DEC part No. 91-07723). However, since only two pairs are used, an equivalent two pair cable may be substituted.

Table 2-1 Maximum Cable Length vs. Baud Rate

Baud Rate	Cable Length
Up to 600	600 m (2000 ft)
Up to 2400	300 m (1000 ft)
Up to 4800	60 m (200 ft)
Up to 9600	30 m (100 ft)

Refer to the *DECdataway User's Guide*, EK-ISB11-UG, for DECdataway installation instructions.

If an EIA (or CCITT V.24) interface is used between the DPM01 and a terminal, the maximum recommended cable run is 10 m (40 ft) regardless of the baud rate.

The DPM01 is intended for wall mounting in any convenient location. While its construction lends itself to a large variety of possible mounting locations, the following factors should be kept in mind in determining the mounting locations.

service access
primary power availability
environmental limitations (see Paragraph 1.4)
routing of data signal cables
local factors (i.e., building codes, personnel safety, etc.).

2.2 UNPACKING
The DPM01 should be unpacked by a DEC Field Service representative. Unpack according to the following procedure:

1. Inspect the shipping container for obvious signs of damage and note any which may have occurred for possible reporting.

2. Remove the DPM01 from its shipping container; save the container and the packing material in case it is necessary to return the equipment.

3. Remove the polyethelene cover from the equipment.

4. Remove any tape or other foreign materials from the cabinet.

5. Inspect the DPM01 for any damage that may have occurred during shipment. Report any damage to the carrier and DIGITAL.

6. Check the contents of the shipping container against the packing list. Report any discrepancies to the carrier and DIGITAL.

7. Place the DPM01 in the location in which it will be tested.

2.3 FIELD ACCEPTANCE PROCEDURE

1. Connect the power cord to an ac power source and, with the keyswitch in the NORMAL position, verify that the DPM01 runs a power-up diagnostic sequence. The POWER light will illuminate and the PORT 0 READY through PORT 2 READY indicators will come on in sequence as the diagnostic runs.

2. Turn the keyswitch to MAINT position, and verify that the DPM01 restarts the diagnostic.

3. Connect a 20 mA loopback plug (DEC Part No. 7015625) to the PORT 0 connector and observe that the PORT 3 indicator illuminates in sequence, indicating a successful pass through the external loop test.

4. Repeat step 3 with the loopback plug connected to the PORT 1 connector.

5. Repeat step 3 with the loopback plug connected to the PORT 2 connector.

6. Repeat step 3 with the loopback plug connected to the PORT 3 connector.

7. Connect an EIA loopback plug (DEC Part No. 7015626) to the PORT 0 connector and observe that the PORT 3 indicator illuminates in sequence, indicating a successful pass through the external loop test.

8. Repeat step 7 with the loopback plug connected to the PORT 1 connector.

9. Repeat step 7 with the loopback plug connected to the PORT 2 connector.

10. Repeat step 7 with the loopback plug connected to the PORT 3 connector.

11. Turn the keyswitch to NORMAL and connect the DPM01 to the DPM host system using the DECdataway Controller test cable (DEC Part No. 7014152). Use either port connector.

<div align="center">

NOTE
The user's DECdataway cable may be used in place
of the test cable if convenient. If any problems occur,
revert to using the test cable for terminal acceptance.

</div>

12. Boot the RSX11-M test disk pack, or use the diagnostic tasks with the user's software, and run MAINDEC-11-DZKCH and MAINDEC-11-DZKCI, error free, for 5 minutes, minimum, each.

13. Connect the 20 mA port-to-port test cable (DEC Part No. 7015627) between PORT 0 and PORT 1. Connect the EIA port-to-port test cable (DEC Part No. 7015628) between PORT 2 and PORT 3.

14. Run DPMTST in loopback mode to perform a complete host-to-DPM01 external loopback system test (time about 30 minutes).

15. The terminal is now ready for user installation. Should the user desire additional checkout (i.e., with the terminal in its final location) DEC Field Service personnel will perform such work at the currently prevailing per-call rates. If any of the customer's terminals are available, they can now be accepted on-line using DPMTST in the terminal demonstration mode.

2.4 INSTALLATION

1. Determine the mounting location for the DPM01.

2. Place the DPM01 on its front on a padded surface and remove the two (2) 10-32 socket head screws and lockwashers securing the bottom of the wall mounting bracket to the cabinet. (See Figure 2-1.)

3. Remove the wall mounting plate from the DPM01.

4. Fasten the wall mounting plate to the wall in the desired location. (See Figure 2-2.)

5. Mount the DPM01 on the mounting plate and secure with the locking screws.

6. Refer to the *DECdataway Installation and Cable Routing Guide* (EK-ISB11-UG). Prepare the DECdataway port connector according to the instructions contained in Chapter 2 of that publication. Wire the address jumpers to coincide with the DECdataway address assigned to Port 0 of the DPM01. The address must not be greater than 60 decimal (73 octal).

WALL
MOUNTING
PLATE

SHOULDER
SCREWS
(DO NOT
REMOVE)

10 - 32x 0.79 cm
(0.31 IN.)
SOCKET HEAD
SCREW

NO. 10
INTERNAL
TOOTH
WASHER

MA-1539
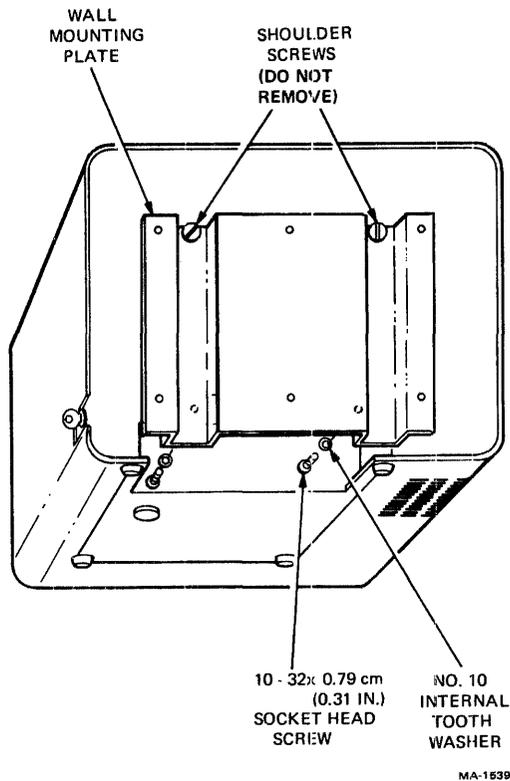
Figure 2-1   Wall Mounting Hardware Details

22.9cm
(9.0 in.)

11.3 cm
(4.5 in.)

11.3 cm
(4.5 in.)

MA-1540
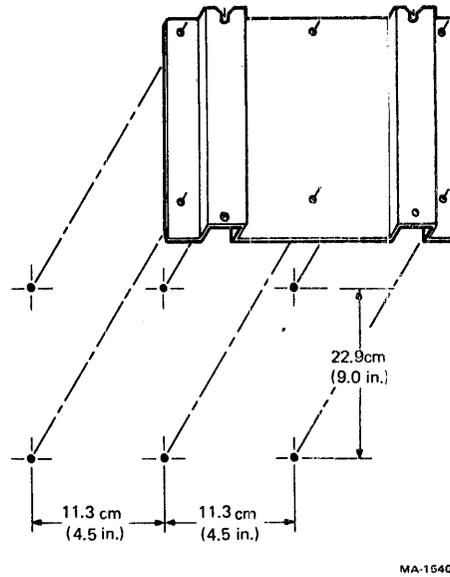
Figure 2-2   Wall Mount Hole Location

7.   Prepare each of the terminal cables at the DPM01 end according to the following procedure:

a.   Strip approximately 3 cm (1-1/4 inches) of sheath from the cable end. Remove the exposed foil shields.

b.   Strip approximately 16 mm (5/8 inch) from each red and black signal wire in the red and green shields. The blue shielded pair is not used.

c.   Join the drain wires (bare wires) together and insulate them with a 25 mm (1 inch) length of tubing.

d.   Crimp a female large gold contact pin (AMP P/N 66592-2) on the drain wires.

e.   If an EIA interface is to be used, twist the two black wires together; otherwise proceed to step f.

f.   Crimp a female contact pin on each of the remaining wires (three or four depending on step e).

g.   Slide a cable clamp (AMP P/N 206322-1) over the assembled cable end, ensuring that all the leads are inside the cable clamp body.

h.   Refer to Table 2-2. Fabricate and insert jumpers if required; otherwise proceed to step i.

2-4

i.   Refer to Table 2-2. Insert the contact pins into the appropriate connector holes, with red-shielded pair to transmit and the green-shielded pair to receive, red wires to + and black wires to – in the case of 20 mA interface, or with both black wires to signal ground (pin 6) in the case of an EIA interface.

j.   Insert the contact pin on the drain wires into connector hole 16.

k.   Slide the cable clamp body up to the plug and screw both parts together.

l.   Select the right size clamp and secure it to the cable clamp body using the screws provided. Be sure that the clamp is sufficiently tightened to provide strain relief for the pin connections.

m.   Inspect the connector assembly, making sure that all connections are secure.

Table 2-2   DPM01 Connector Pin Assignments

Interface	Signal	Pin Number
20-mA active (DPM01 provides current)	Transmit Data Source (+)	8
	Transmit Data Return (–)	6
	Receive Data Source (+)	12
	Receive Data Return (–)	10
	Jumper	5 to 7
	Jumper	9 to 11
20-mA passive (Terminal provides current)	Transmit Data positive (+)	7
	Transmit Data Negative (–)	8
	Receive Data Positive (+)	11
	Receive Data Negative (–)	12
EIA	Transmit Data	3
	Receive Data	4
	Signal Ground	6
	Protective Ground	16

8.   Prepare the terminal ends of each cable to be used with a 20 mA current loop terminal according to the following procedure:

a.   Remove approximately 5 cm (2 inches) of sheath from the cable end.

b.   Remove the foil shields and drain wires from the red and green twisted pairs. Cut off the blue pair flush with the end of the sheath; it will not be used.

c.   Strip approximately 16 mm (5/8 inch) of insulation from each of the conductors.

d.   Crimp a female large silver contact pin onto each of the wires.

e.   Insert the pins into the Mate-N-Lok connector body according to the following table.

Shield Color	Wire Color	Pin Number	Signal
Red	Red	5	Transmit+
	Black	2	Transmit–
Green	Red	7	Receive+
	Black	3	Receive–

9.   Prepare the terminal ends of each cable to be used with an EIA terminal according to the following procedure:

a.   Remove approximately 5 cm (2 inches) of sheath from the cable end.

b.   Remove the foil shields from the red and green twisted pairs. Cut off the blue pair flush with the end of the sheath. It will not be used.

c.   Twist the two drain wires (bare wires) together and insulate them with 4 cm (1-1/2 inches) of tubing.

d.   Strip approximately 6 mm (1/4 inch) of insulation from each of the conductors.

e.   Crimp a female small gold pin onto each of the conductors and insert the pins into the connector body according to the following table:

Shield Color	Wire Color	Pin Number	Signal
Red	Red	3	Received Data
	Black	7	Signal Ground
Green	Red	2	Transmitted Data
	Black	7	Signal Ground
Drain wires	bare	1	Protective Ground

CHAPTER 3
OPERATOR'S GUIDE

3.1 GENERAL
This chapter contains instructions for operating the DPM01 and for running and interpreting the operator's diagnostics.

There are three operating modes for the DPM01; they are Normal Mode, Diagnostic Mode, and Supervisory Mode. A key operated switch is used to control mode selection.

The Diagnostic mode is entered whenever the DPM01 is powered up or the keyswitch is turned to MAINT. In this mode, the functions of the microprocessor module, the DECdataway communications module and terminal interface module are checked. The tests are performed by the microprocessor module and the status and progress of the tests is indicated by the LEDs on the front panel. If the keyswitch is left in MAINT position, the DPM01 will continue to cycle through the diagnostic routines as long as no errors are detected. If an error is detected, the unit will halt or exit to Normal mode.

The Normal mode is entered if the keyswitch is turned to NORM and the unit has completed running a Diagnostic cycle. This is the operating mode in which the ports attempt to come on-line to the host processor. If, however, during the running of tests in the Diagnostic mode, a failure was detected on any of the ports, the affected ports will not come on-line.

The Supervisory mode is used to facilitate testing. There are two variations of this mode, Supervisory mode 1 and Supervisory mode 2. In mode 1, only port 0 will come on-line, and it will do so regardless of any terminal interface hardware failures.

The use of mode 1 permits the host resident diagnostic programs to exercise a DPM01 without requiring four DECdataway addresses. Also in mode 1, the address jumpers in the DECdataway connector plug can be verified. Supervisory mode 1 is entered by turning the keyswitch first to MAINT then immediately to SUPV. In mode 2, all of the parts of DPM01 are dropped off-line and characters entered from the attached terminals will be echoed back to them. This provides an off-line test capability for the terminals and cabling. Supervisory mode 2 is entered by turning the keyswitch to SUPV while the DPM01 is operating in the Normal mode.

3.2 INDICATORS
There are five indicators on the DPM01. One indicator always shows the status of the 5 V power supply. The other four indicators show the state of the four terminal ports when the DPM01 is in the Normal or Supervisory mode. When the DPM01 is operating in the Diagnostic mode these indicators show the progress and status of the diagnostic test routines. The operation of the indicators is summarized in Tables 3-1 and 3-2.

3-1

Table 3-1 Normal and Supervisory Mode 1 Indicators

Indicator	Function
PORT 0	Indicates the state of Port 0
PORT 1	Indicates the state of Port 1
PORT 2	Indicates the state of Port 2
PORT 3	Indicates the state of Port 3

Table 3-2 Diagnostic Mode Indicators

Indicator	Function
PORT 0	Indicates that the M7122YA microprocessor test is in process when lit.
PORT 1	Indicates that the M7127 DECdataway communications module test is in process when lit.
PORT 2	Indicates that the M7128 terminal multiplexer module test is in process when lit.
PORT 3	Indicates that the M7128's terminal cable driver and receiver test is in process when lit. At least one loopback test plug must be installed for this test to function.

In Normal mode and Supervisory 1 mode, each PORT LED indicates that the port is in one of four states:

a. OFF = RESET   Diagnostics have detected an error on that port. It is off-line and the hardware is reset.

b. ON = ACTIVE   The port is on-line and an applications task is reading or writing on the port.

c. MOSTLY OFF, BLINKING ON = OFF-LINE IDLE   The port has not communicated with the host since entering Normal mode.

d. MOSTLY ON, BLINKING OFF = ON-LINE IDLE   The port has communicated with the host since entering normal mode but no applications task is presently reading or writing on the port.

In Supervisory mode 2, the PORT LEDs will be either off or on; off indicates that a failure has been detected by the diagnostic and on indicates that echoing will occur. No ports will go on line in this mode.

3.3 TROUBLESHOOTING

This section contains information for isolating troubles in a malfunctioning unit. The primary tool for this troubleshooting is the built-in diagnostic routines of the DPM01. The procedures given in this section describe the operation of the diagnostic tests and how to interpret the results.

3.3.1 General Diagnostic Testing

Figure 3-1 shows a procedure which should be followed in the event a non-apparent failure has occurred. Use of this procedure will usually localize the problem to one of the DPM01's modules or a terminal. The diagnostic test routine should complete within ten seconds, and will continue as long as the keyswitch is turned to MAINT. If only one loopback plug is available, it should be plugged into successive ports for each pass of the diagnostics until all four ports have been tested. The loopback plug may be moved without generating an error during the test as long as the PORT 2 or PORT 3 LED is not lit while the loopback plug is being removed or inserted. If the DPM01 halts during the diagnostic routine, one of the PORT LEDs should be on, indicating a failure has occurred on the corresponding module (see Table 3-2). If a port failure occurs, the LED which corresponds to that port will be off and the DPM01 will return to the Normal mode.
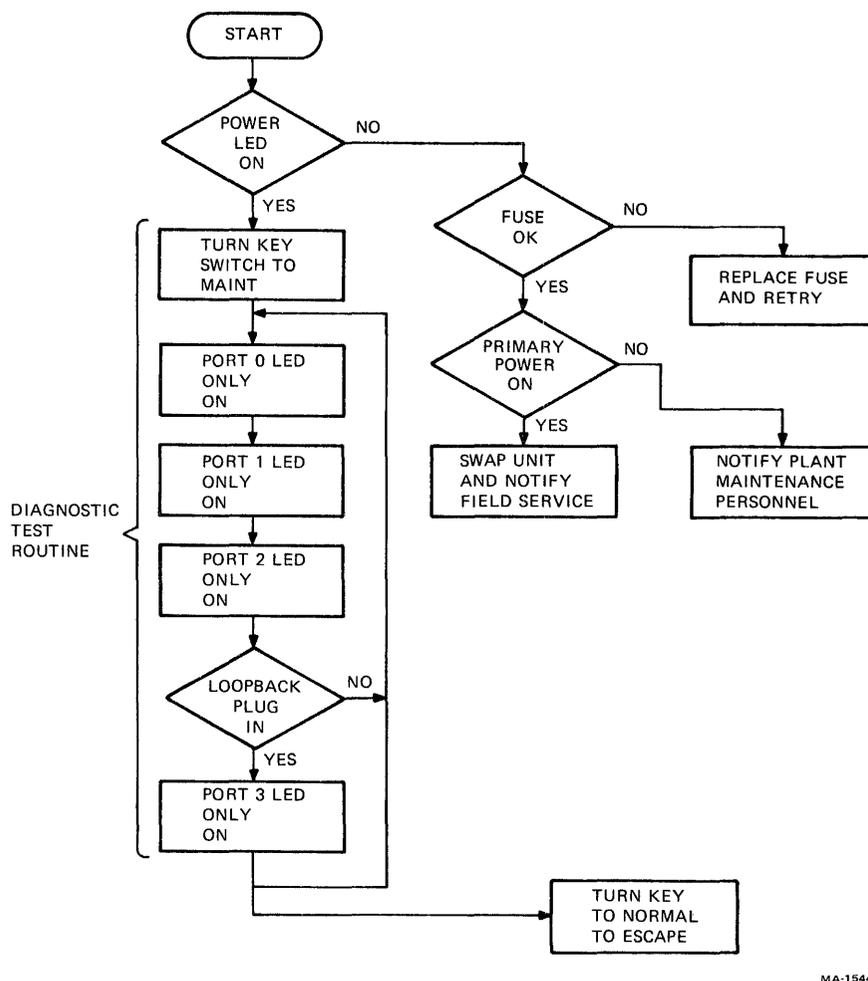
MA-1544

Figure 3-1   Operator's Troubleshooting Flowchart

3-3

3.3.2 Echo Test (Supervisory Mode 2)

The echo test is used to test the DPM01s terminals and cabling and the interface module. This test is initiated whenever the keyswitch is turned to SUPV while the DPM01 is in the Normal mode. The DPM01 is dropped off-line while the echo test is running. All printable characters will be echoed, as long as the characteristics of the terminals agree with the characteristics for the port in the DPM01. If the DECdataway cable was disconnected or the host processor was not running when the DPM01 entered Normal mode and then Supervisory mode, the default characteristics will be set for each port. These are 300 baud, 8-bit characters and no parity (LA36).

3.3.3 DECdataway Address Verification

This test is used to ensure that the physical device address wired into the DECdataway connector agrees with the assigned device address. This test is initiated whenever the keyswitch is turned to SUPV while the DPM01 is in the Diagnostic mode. At the completion of the test routine the octal address of port 0 will be printed on a terminal connected to port 1 if it is a 300 baud LA36 type terminal. The DECdataway cable connector must be installed for this test. The test results should be address 77 (octal) if the connector is not installed. Refer to Figure 3-2 for a flowchart of this procedure.

```
          ┌─────────────┐
          │    START    │
          └─────────────┘
                 │
        ┌────────────────┐
        │  TURN KEY-     │
        │  SWITCH TO     │
        │  MAINT         │
        └────────────────┘
                 │
        ┌────────────────┐
        │ TURN KEYSWITCH │
        │ IMMEDIATELY TO │
        │ SUPV           │
        └────────────────┘
                 │
        ┌────────────────┐
        │ DPM01          │
        │ RUNS DIAGNOS-  │
        │ TIC SEQUENCE   │
        └────────────────┘
                 │
            ◇─────────◇
           ╱ DATAWAY   ╲      NO
          ◇ CONNECTOR   ◇──────────────┐
           ╲ INSTALLED ╱               │
            ◇─────────◇                │
                 │ YES                 │
        ┌────────────────┐    ┌────────────────┐
        │ PORT 0 ADDRESS │    │ DEFAULT ADDRESS│
        │ PRINTED OUT    │    │ 77₈ PRINTED    │
        │ ON PORT 1      │    │ OUT ON PORT 1  │
        └────────────────┘    └────────────────┘
                                   MA-1542
```
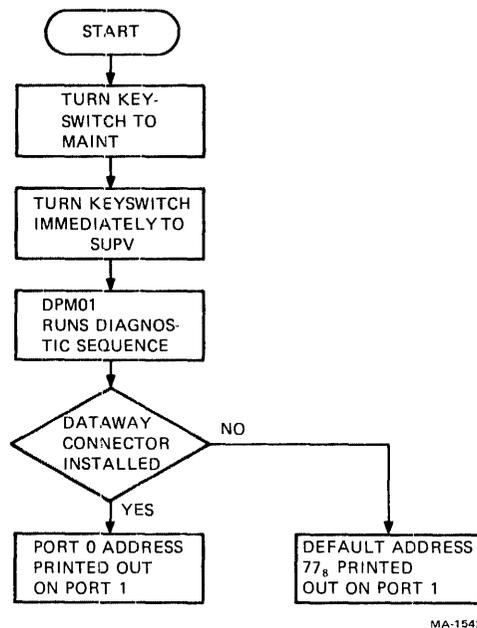
Figure 3-2   Dataway Address Test Flowchart

APPENDIX A
FDM SERVICE ADDENDUM

An FDM service addendum policy is available as a rider to the service contract on the DPM host system. The FDM addendum pertains only to terminals connected to the DECdataway. The general terms of the FDM addendum are:

The customer assumes responsibility for first level maintenance by identifying any malfunctioning terminal and replacing it with a spare terminal which the customer has purchased for that purpose. DEC Field Service personnel will maintain a stock of spare parts and effect the actual repair of any fault.

Customer's responsibilities are:

1. To purchase one or more DPM01 terminal multiplexers defined in the agreement. They will be extra terminals, kept only as spare units and therefore, no maintenance charge will be made for them.

2. To provide storage space for the spare terminals and a maintenance area near the distributed plant management (DPM) host system. The maintenance area should have a work surface, several ac power receptacles, and adequate lighting. An area like this may be necessary even without the FD addendum, since in many cases a terminal will be operating in an environment where it should not be opened for service. The maintenance area should have a DECdataway port, with address one, available at the workbench in order to use on-line diagnostic tasks in the DPM host system to verify the on-line operation of a repaired terminal.

3. To have maintenance personnel assigned who will replace a malfunctioning terminal, return the failing unit to the maintenance area, and notify the local DEC Field Service office.

DEC responsibilities are:

1. To keep on-hand sufficient spare parts, and expertise, to repair FDM terminals.

2. To repair any malfunctioning DPM01 which the customer has returned to his maintenance area, by replacing the defective field replaceable unit.

3. To perform complete operational checks, including any necessary cleaning on any repaired DPM01 so that DPM01 can be effectively used as the spare unit.

The normal sequence of events should be as follows:

1. The FDM terminal operator should notify the supervisory or maintenance personnel of any fault.

2. The fault should be verified and identified by use of the internal diagnostics.

3. Remove the defective DPM01 and install a replacement. If the DPM01 is malfunctioning, the customer's maintenance personnel should get the spare unit of the same type from its storage area and use it to replace the malfunctioning on-line unit.

4. The customer's maintenance personnel should return the malfunctioning unit to the work area and notify the local DEC Field Service office.

5. The local DEC office will schedule a service representative to repair the unit and check it out so that it can be stored for use as a spare unit.

NOTE
This procedure under the FDM addendum does not preclude the DEC Field Service representative from troubleshooting any FDM terminal problem at the terminal on-line location if that becomes necessary.

Table B-1   DECdataway Connector Addressing Data

Terminal Octal	Address Decimal	Address Jumper (Fig. 2-5) Connected Between Contacts	Terminal Octal	Address Decimal	Address Jumper (Fig. 2-5) Connected Between Contacts
1	1	3&4, 5&6, 7&8, 9&10, 12&15	41	33	5&6, 7&8, 9&10, 12&15
2	2	3&4, 5&6, 7&8, 9&10, 13&16	42	34	5&6, 7&8, 9&10, 13&16
3	3	3&4, 5&6, 7&8, 9&10	43	35	5&6, 7&8, 9&10
4	4	3&4, 5&6, 7&8, 12&15, 13&16	44	36	5&6, 7&8, 12&15, 13&16
5	5	3&4, 5&6, 7&8, 12&15	45	37	5&6, 7&8, 12&15
6	6	3&4, 5&6, 7&8, 13&16	46	38	5&6, 7&8, 13&16
7	7	3&4, 5&6, 7&8	47	39	5&6, 7&8
10	8	3&4, 5&6, 9&10, 12&15, 13&16	50	40	5&6, 9&10, 12&15, 13&16
11	9	3&4, 5&6, 9&10, 12&15	51	41	5&6, 9&10, 12&15
12	10	3&4, 5&6, 9&10, 13&16	52	42	5&6, 9&10, 13&16
13	11	3&4, 5&6, 9&10	53	43	5&6, 9&10
14	12	3&4, 5&6, 12&15, 13&16	54	44	5&6, 12&15, 13&16
15	13	3&4, 5&6, 12&15	55	45	5&6, 12&15
16	14	3&4, 5&6, 13&16	56	46	5&6, 13&16
17	15	3&4, 5&6	57	47	5&6
20	16	3&4, 7&8, 9&10, 12&15, 13&16	60	48	7&8, 9&10, 12&15, 13&16
21	17	3&4, 7&8, 9&10, 12&15	61	49	7&8, 9&10, 12&15
22	18	3&4, 7&8, 9&10, 13&16	62	50	7&8, 9&10, 13&16
23	19	3&4, 7&8, 9&10	63	51	7&8, 9&10
24	20	3&4, 7&8, 12&15, 13&16	64	52	7&8, 12&15, 13&16
25	21	3&4, 7&8, 12&15	65	53	7&8, 12&15
26	22	3&4, 7&8, 13&16	66	54	7&8, 13&16
27	23	3&4, 7&8	67	55	7&8
30	24	3&4, 9&10, 12&15, 13&16	70	56	9&10, 12&15, 13&16
31	25	3&4, 9&10, 12&15	71	57	9&10, 12&15
32	26	3&4, 9&10, 13&16	72	58	9&10, 13&16
33	27	3&4, 9&10	73	59	9&10
34	28	3&4, 12&15, 13&16	74	60	12&15, 13&16
35	29	3&4, 12&15	75	61	12&15
36	30	3&4, 13&16	76	62	13&16
37	31	3&4	77	63	No Jumpers Used
40	32	5&6, 7&8, 9&10, 12&15, 13&16			

NOTES

Address 0 is reserved for the system broadcast.

This pattern of physical addresses is duplicated for each DECdataway on a DPM system.

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