PM-F11/LS9

Backplane Manual

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Section 1
General Information

1.1 INTRODUCTION

This manual presents the description, installation, maintenance and troubleshooting procedures for the PM-F11/LS9 mounting assembly manufactured by Plessey Peripheral Systems, Irvine, California.

The material in this manual is arranged into three sections as follows:

Section 1 - GENERAL INFORMATION. This section contains the scope and arrangement of the manual and a brief electrical and physical description of the PM-F11/LS9.

Section 2 - INSTALLATION. This section contains requirements and procedures for installing the mounting assembly.

Section 3 - MAINTENANCE AND TROUBLESHOOTING. Recommended general maintenance procedures are described, as well as general troubleshooting procedures.

DRAWINGS. A separate drawing package, MD 701195, contains the parts lists, assembly drawings and schematics necessary for a complete understanding of the PM-F11/LS9.

1.2 PHYSICAL DESCRIPTION

The PM-F11/LS9 is a prewired backplane designed to accept Q-bus devices for use in the Digital Equipment Corporation (DEC) LSI-11 series computers.*

The PM-F11/LS9 is a 9-slot double system unit (SU) Q-bus backplane. It contains 18 dual Q-bus expansion slots and 7 dual user defined expansion slots. It also contains a +15VDC to +12VDC power regulator capable of supplying 3.5 amps of +12VDC power.

The PM-F11/LS9 accepts a 10-pin ribbon cable connector for interface to a front panel. Signals include +5V and 0V for DC ON, BDCOK H, BHLTL, BEVNTL, LTC 1, BREFL, and SRUNL.

*DEC, LSI-11, and Q-bus are registered trademarks of Digital Equipment Corporation.

The PM-F11/LS9 is a 9-slot backplane which accepts +5V, +15V, and -15V power supply inputs.

Power is supplied to the backplane via a power cable which is supplied with the unit.

Three power cables are available to accommodate different computer chassis. The three cables, corresponding PM-F11/LS9 part numbers, and their applications are shown in Table 1-1. It is important to specify the complete system model number when ordering backplanes.

PLESSEY BACKPLANE KIT NUMBER	POWER CABLE CONFIGURATION	RECOMMENDED APPLICATIONS
701635-100	A-B Exit 9-P, 9-P Plug	PM-1150/4A PM-1150/6 Micro I, 10.5"
701635-200	E-F Exit 9-P, 9-P Plug	Micro I, 5.25"
701635-300	A-B Exit 15-P, 6-P Plugs	PM-1150/5 DEC BA11K

TABLE 1-1: POWER CABLE APPLICATIONS

Section 2
Installation

2.1 UNPACKING AND INSPECTION

Visually inspect the shipping container for damage. If the shipping container is damaged, it should be saved. If the unit proves to be damaged in shipment and an insurance claim is filed, the carrier may wish to examine the shipping container.

Open the shipping container, remove the assembly, and inspect for physical damage.

2.2 INSTALLATION

Before beginning to install the PM-F11/LS9, insure that all necessary parts and equipment are available. The following parts should have been supplied with the mounting panel kit:

- PM-F11/LS9 mounting panel, Part Number 701714
- Power cable; part numbers are listed in Table 1-1

Another part that may be required is a DEC REV 11-A or Plessey PM-REV11 with bus terminator. The only tool required is a medium screwdriver.

2.2.1 Installation of the Mounting Panel

The installation of the mounting panel varies slightly depending on the exact chassis type. Use the following general procedures and refer to Figure 2-1.

1. Slide mounting box out from rack and remove bottom and top covers if necessary.
2. Set the PM-F11/LS9 against the mounting rail adjacent to the last system unit in the box.
3. Align the two mounting screws with the holes in the mounting rails and screw them down securely.
4. Insure that the "A" connector of the PM-F11/LS9 is oriented in the same direction as the existing system units.

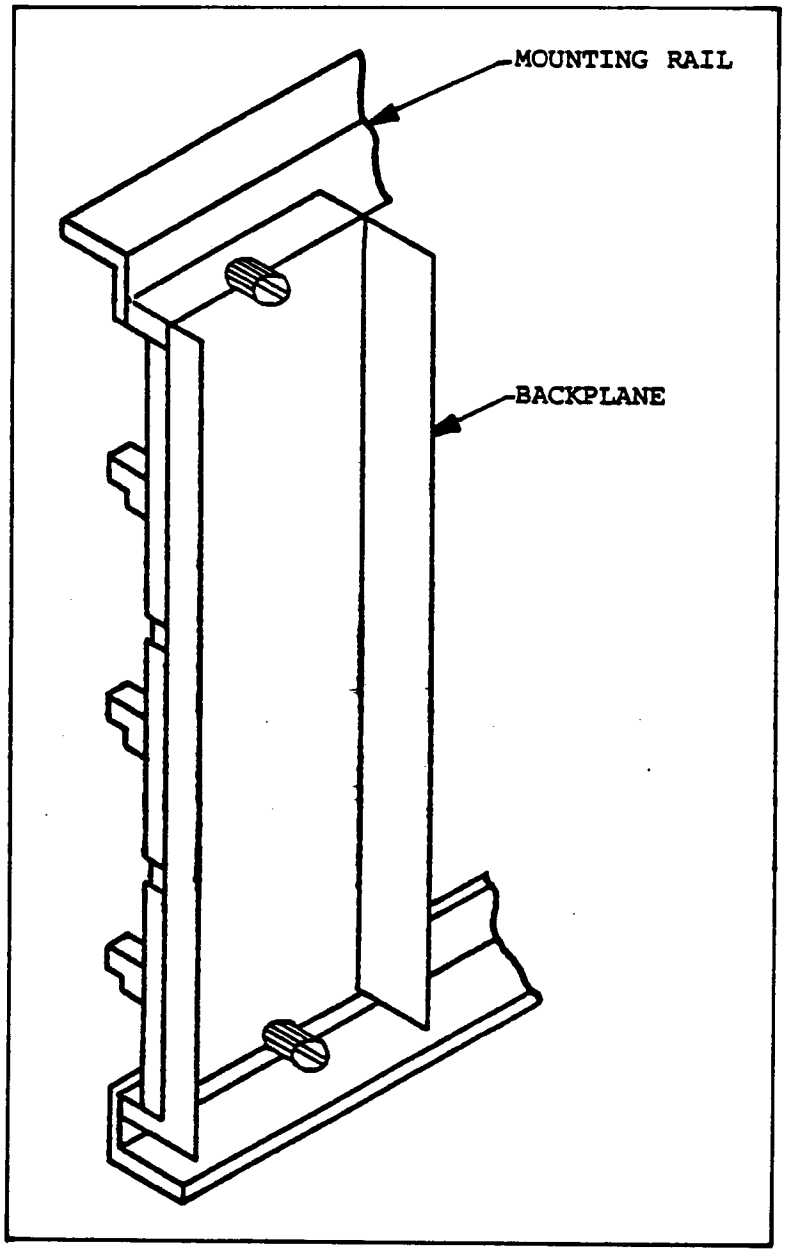


FIGURE 2-1: BACKPLANE INSTALLATION

2.2.2 Power Cable

Power to the assembly is provided by a power cable which connects to the back of the mounting panel. Connections are shown in Table 2-1.

Application: 701635-100 (9-P, 9-P Plug A-B Exit) 701635-200 (9-P, 9-P Plug E-F Exit)		
PIN NUMBER	SIGNAL	COLOR
P2-1	DCLO	Violet
P2-2	ACLO	Yellow
P1-9	+5V	Red
P1-4 (A-B Exit Only)	Ground	Black
P1-5 (E-F Exit Only)	Ground	Black
P2-5	Ground	Black
P2-7	LTC	Brown
P2-8	+15	Gray
P2-9	+5	Red

Application: 701635-300 (15-P, 6-P* Plugs A-B Exit)		
PIN NUMBER	SIGNAL	COLOR
P2-2	LTC	Brown
P1-2	+15V	Gray
P2-4	ACLO	Yellow
P2-3	DCLO	Violet
P1-1	+5V	Red
P1-5	0V	Black
P1-4	+5V	Red
P1-9	0V	Black
*NOTE: P1 is 15-P plug; P2 is 6-P plug.		

TABLE 2-1: POWER CABLE CONNECTIONS

Once the cable is connected to the backplane, the cable should be routed between connector rows and plugged into the power socket on the mounting box.

CAUTION

Careful routing of the cable is necessary to avoid damage to the backplane and/or system. Cables must be routed between connector rows, not across the top.

2.2.3 Front Panel Interface

Connection is made to the front panel through a 10-pin ribbon cable connector. The signals and their locations are shown in Figure 2-2.

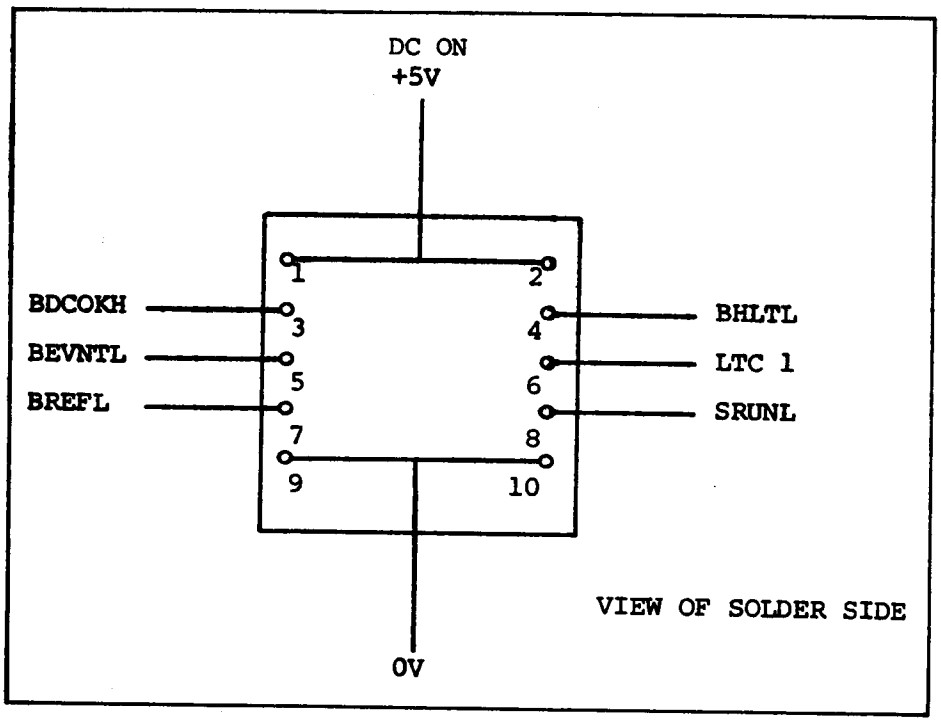


FIGURE 2-2: PIN ASSIGNMENTS FOR FRONT PANEL INTERFACE CABLE

2.3 MODULE UTILIZATION

This section explains the installation of mounting cards in the PM-F11/LS9. All cards should be installed with the component side toward the number one connector row.

2.3.1 Module Location

When interrupt or DMA devices are used on the Q-bus, location of these modules becomes critical. The PM-F11/LS9 priorities are as follows:

- J1-A, B — Highest priority reserved for CPU
- J9-A, B
- J9-C, D
- J1-C, D
- J2-C, D
- J2-A, B
- J3-A, B
- J3-C, D
- J4-C, D — Figure 2-3 shows proper sequence of module insertion.
- J4-A, B
- J5-A, B
- J5-C, D
- J6-C, D
- J6-A, B
- J7-A, B
- J7-C, D
- J8-C, D
- J8-A, B — Lowest priority

Modules must be plugged in from the highest priority location to the lowest priority location. No empty slots are allowed between the first and last modules plugged into the Q-bus.* Empty slots must follow the modules and be of the lowest priority.

The seven dual user expansion slots are located from J3-E and F to J9-E and F. These slots have all wire wrap pins and the only lines that are bussed are shown in Table 2-2. All other lines are available for user interconnections. See Figure 2-3 for the location of connectors and power regulator board.

*Except the PM-REV11 terminator which should be at the end of the bus, i.e., J8, C-D.

PIN	SIGNAL	SOURCE
EA2	+5VDC power	Available from system PWR
EA2	+5VDC power	Available from system PWR
EB2	-12VDC power	Not available but bussed
FB2	-12VDC power	Not available but bussed
EC2	Ground	Available from system power
FC2	Ground	Available from system power
ED2	+12VDC power	Available from system power
FD2	+12VDC power	Available from system power

TABLE 2-2: BUSSED LINES FOR PM-F11/LS9
(User expansion area)

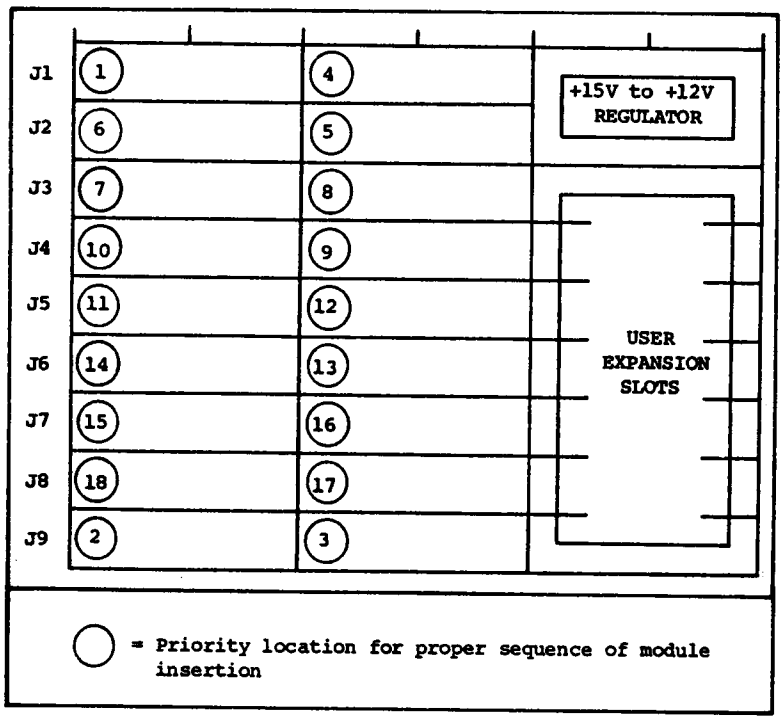


FIGURE 2-3: PM-F11/LS9 BACKPLANE VIEWED FROM THE CONNECTOR SIDE

2.3.2 Power Regulator

The +15VDC to +12VDC power regulator is mounted on a large black heat sink and is bolted to the associated backplane. When the backplane is installed in the chassis, the heat sink is oriented the same as the PC boards that plug into the backplane.

On the power regulator (as viewed from the card insertion side of the backplane) are a trimpot and two test pins. The +12VDC can be measured at these test pins and adjusted with the trimpot. The +12VDC is preset to +12VDC $\pm$ 0.05VDC. Refer to Figure 2-4.

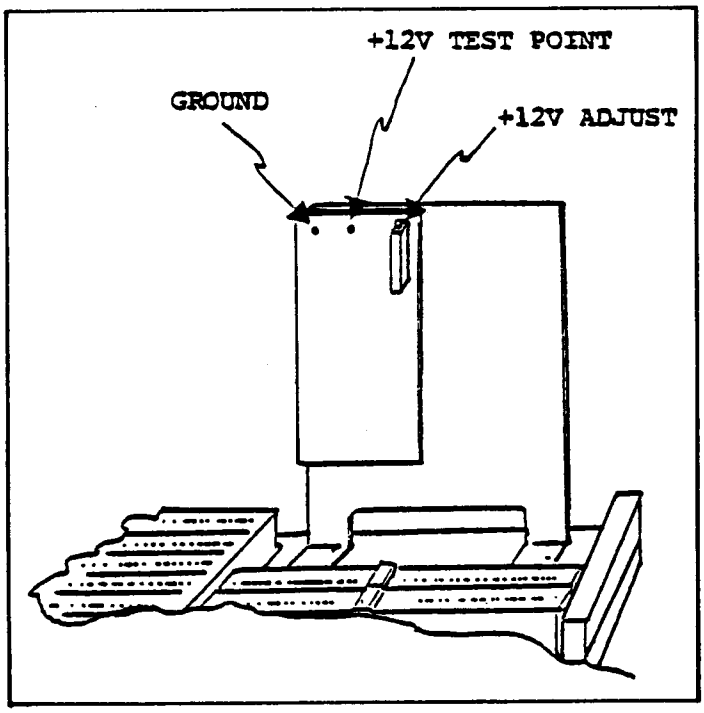


FIGURE 2-4: POWER REGULATOR TRIMPOT ADJUST LOCATION

Section 3

Maintenance and Troubleshooting

3.1 PERIODIC MAINTENANCE

The PM-F11/LS9 requires no periodic maintenance; however, when cards are removed after being installed for extended periods of time, it is recommended that the contacts of the connectors be cleaned. Contact cleaning procedure is described below.

The card connector contacts should be cleaned with alcohol or LPS Instant Contact Cleaner. Saturate the contact area thoroughly. While the contacts are still wet, scrub with a soft natural bristle brush.

CAUTION

Do not use Freon to clean contacts of the connectors in this assembly.

3.2 MAINTENANCE EQUIPMENT

Table 3-1 lists equipment which is useful for diagnosing and repairing the backplane assembly.

EQUIPMENT	MANUFACTURER	MODEL/PART NUMBER (or equivalent)
Oscilloscope	Tektronix	465
Current Probe	Tektronix	P6021
VOM	Simpson	260
Soldering Iron	Weller	WTCPL
Wire Wrap Gun	Standard Pneumatic Motor	615
Wire Wrap Sleeve	Standard Pneumatic Motor	60340
Wire Wrap Bit	Standard Pneumatic Motor	53110
Wire Wrap Unwrap Tool	Standard Pneumatic Motor	691
Diagonal Cutters	Commercial Standard	N/A
Needle Nose Pliers	Commercial Standard	N/A
Screwdriver - Medium Slot	Commercial Standard	N/A
Contact Cleaner	Freon or Commercial Standard	N/A

TABLE 3-1: MAINTENANCE EQUIPMENT

3.3 FAULT ISOLATION AND REPAIR

The PM-F11/LS9 is basically a wired connector panel and as such has no components to fail. Failures in the unit will generally fall into one of the following categories:

- Open wires
- Shorted wires or pins
- Foreign material in the backplane
- Improperly installed cards

To isolate a failure, the following procedures are recommended:

- Insure that the panel is securely fastened to the mounting rails
- Insure that all cards are properly seated
- Visually inspect the back side of the assembly for bent or shorted pins, frayed or broken wires, or foreign material, such as loose screws or pieces of wire

If the above procedures do not yield a satisfactory result, the suspected signal paths may be checked for proper connection with an ohmmeter or scope. Use the pin assignment chart found in the Maintenance Drawing Package.