PMC-712-FS

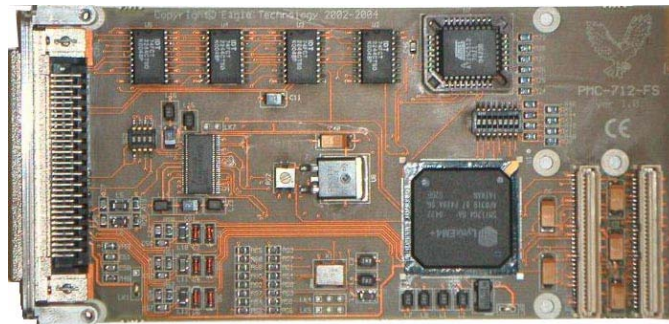## User's Manual for
PMC-712-FS PMC Mezzanine Display Board
Compatible with CompactPCI and VME

Eagle Technology – Cape Town, South Africa
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PMC Display Cards for
PMC Single Board Computers
PCI Mezzanine Peripheral Cards

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1 Introduction

The PMC-712-FS is a PCI type mezzanine display card compatible with PMC enabled single board computers. These are found in CompactPCI and VME type systems. The PMC-712-FS support TFT, CRT and DSTN display and also Low Voltage Differential Signaling or LVDS for TFT.

The PMC-712-FS is based on the Silicon Motion Inc. LynxEM+ SM712 graphics display controller for mobile computing. The SM712 controller has built-in 4 mega byte of display memory. The LynXEM+ offers enhanced capabilities for dual view and handling dual view applications. Through its Virtual Refresh architecture it can simultaneously drive both CRT and LCD. Each display can support independent full screen full motion video, as well as independent graphics refresh rates, resolutions, and color depths.

The LynxEM+'s Concurrent Video Processor Unit provides superior video quality for real-time video playback. LynxEM+'s Video Processor supports multiple independent full screen, full motion video windows with overlay.

A peripheral connector is located on the external bracket that contains the necessary connections for CRT, flat panel data and LVDS. The board can be configured via hardware for a specific type of LCD display.

1.1   Features

- LynxEM+ mobile display controller by Silicon Motion Inc.
- PMC bus interface
- Analog VGA output
- Flat panel data output
- LVDS output
- 4 mega byte memory

1.2   Software Support

The PMC-712-FS has drivers for Windows Operating Systems and Linux. This software is located at *<EAGLECD>\Display Cards\PMC-712-FS\Drivers*. The manual is located at *<EAGLECD>\Display Cards\PMC-712-FS\Doc*.

- Windows 9X - LynxEM+_win9xdrv_xxx.zip
- Windows ME - LynxEM+_winMEdrv_xxx.zip
- Windows 2K - LynxEM+_Win2K_xxx.zip
- Windows CE - LynxEM+_WinCE4.2_xxxx_Display_xxx.zip
- VXWorks - LynxEM+_VXWorks xxxx.zip
- Linux - LynxEM+_XFree86_xxx.zip

1.3   Contact Details

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2

2 Getting Started

This chapter describes how to install and configure the PMC-712-FS for the first time. Follow the instructions to get your display board up and running.

2.1 Package Items

The package contains one (x1) PMC type display board and one (x1) software CD-Rom. The software CD-Rom contains all the software necessary to install the drivers. Read the section relevant to your operating system. The drivers are located at *<EAGLECD>\Display Cards\PMC-712-FS\Drivers*.

2.2 Windows 9x / ME / 2000 / XP

1. **Switch-off your computer.**
2. **Find an open PMC slot supporting PCI rev2.1 @ 5V.**
3. **Install the card and screw in all necessary screw to secure the board to the motherboard.**
4. **Connect your CRT or LCD display.**
5. **Switch-on your computer again.**
6. **Select the correct file and unzip files to a temporary directory.**
7. **When ask for the driver files by the Windows direct it to this directory.**
8. **Unzip the files in the *LynxEM+_ControlPanel_Eng_xxx.zip.***
9. **Run the installation application to install the control panel utility.**
10. **Use the Windows display manager to setup the board.**
11. **Also see the section on dipswitch settings to pre-configure the board for a specific type of LCD display.**

2.3 Linux

Please see *the install.txt* file in the zip file *LynxEM+_XFree86_1.2.2.zip.*

2.4 VXWorks

See the VXWorks installation reference manual of how to install the driver.

3

3 Hardware Interface

The PMC-712-FS has one peripheral connector to connect to either a CRT monitor and/or a flat panel display. The flat panel interface has connections for both data and LVDS.

3.1 Peripheral Interface Connector

The peripheral connecter is located on the front bracket. The connecter is a type SCSI II DSUB male. The connector part no is *Honda PCS-E68LMD*. The mating connector is *Chan Sincere FMD68FX & shell MML68XL*.
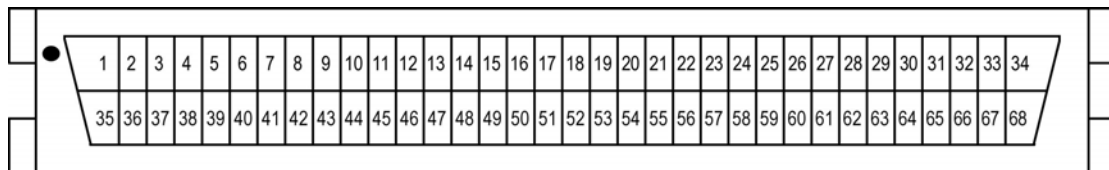
Figure 3-1 Peripheral Connector SCSI II DSUB Male

3.1.1 Pin assignments

The table below shows the pin assignments of the peripheral connector.

Pin No	Signal Name	Pin No	Signal Name
1	DAT0	35	DAT1
2	DAT2	36	DAT3
3	DAT4	37	DAT5
4	DAT6	38	DAT7
5	DGND	39	DGND
6	DAT8	40	DAT9
7	DAT10	41	DAT11
8	DAT12	42	DAT13
9	DAT14	43	DAT15
10	DGND	44	DGND
11	DAT16	45	DAT17
12	DAT18	46	DAT19
13	DAT20	47	DAT21
14	DAT22	48	DAT23
15	DGND	49	DGND
16	HSYNC	50	DGND
17	VSYNC	51	DGND
8	DE	52	DGND
19	FPSCLK	53	DGND
20	DGND	54	DGND
21	TXOUT3-	55	TXOUT3+
22	TXOUT0-	56	TXOUT0+
23	TXOUT1-	57	TXOUT1+

24	TXOUT2-	58	TXOUT2+
25	DGND	59	DGND
26	TXCLKOUT-	60	TXCLKOUT+
27	DGND	61	DGND
28	SDA	62	SCL
29	CRTRED	63	CRTGREEN
30	CRTBLUE	64	CRTHSYNC
31	CRTRET	65	CRTVSYNC
32	FPPWR	66	FPPWR
33	NC	67	NC
34	NC	68	NC

Table 3-1 Peripheral Connector Pin Assignments

3.1.2   Signal Definitions

This sections deals with all the signals abbreviations.

Signal	Description
DAT0-23	Flat panel data lines
HSYNC / LP	DSTN LCD: Line Pulse
	TFT LCD: Horizontal Sync
VSYNC / FP	DSTN LCD: Frame Pulse
	TFT LCD: Vertical Sync
FPSCLK	Flat panel shift clock. This is the pixel clock for flat panel data
DE	Display Enable
TXOUT0-3-	LVDS negative lines
TXOUT0-3+	LVDS positive lines
TXCLKOUT+	LVDS clock positive
TXCLKOUT-	LVDS clock negative
SDA	CRT I2C data line
SCL	CRT I2C clock line
CRTHSYNC	CRT horizontal sync
CRTVSYNC	CRT vertical sync
CRTRED	CRT red line
CRTBLUE	CRT blue line
CRTGREEN	CRT green line
CRTRET	CRT Return
FPPWR	Flat panel power
DGND	Digital Ground
NC	Not Connected

Table 3-12 Signal definitions

3.2   Pin Descriptions

3.2.1   Flat panel data lines (DAT0-23)

This is the 24-bit data interface for DSTN and TFT flat panels. Depending on the interface type and data bus width some or all lines will be connected.

3.2.2   Sync Lines (HSYNC, VSYNC)

These lines are either the frame and line pulse lines for DSTN or the vertical and horizontal sync pulses for TFT.

3.2.3   Display Enable (DE)

The display enable pin. It indicated the active horizontal display time when low.

3.2.4   LVDS Port (TXOUT0-3+-, TXCLKOUT+-)

The LVDS pins include the output and return data lines *TXOUT0-3+-* and clock lines *TXCLKOUT+-.*

3.2.5   CRT Port (CRTVSYNC, CRTHSYNC, CRTRED, CRTBLUE, CRTGREEN, CRTRET, SDA, SCL)

The CRT port includes the color current output lines and return and vertical and horizontal sync. The I2C data lines are also included.

3.2.6   Flat Panel Power (FPPWR)

This is the flat power pin. Please note that no power management is included in the PMC-712-FS version 1.0. This pin will power-up together with the system.

3.2.7   Digital ground (DGND)

Digital ground pin.

3.2.8   Not Connected (NC)

This pin is not connected. Meaning don't connect to this pin. It can be used for manufacturing purposes.

3.3   Bus Connectors & Compatibility

The two standard MOLEX PMC connecters are located on the board to connect to any standard PMC bus. The board is mezzanine mounted so care should be taken when mounting it onto a PMC compatible motherboard.

3.3.1   Power Requirements

The board will work on a 5 volt and 3 volt PMC bus.

3.3.2   Compatibility

32-bit PCI compatibility is required, complying with PCI local bus specification revision 2.1. PCI-X is not supported.

3.4   Hardware Settings

DSTN, TFT and LVDS TFT flat panel displays are supported. The settings section shows how to pre-configure your device for the appropriate display mode. The DIP switch is located on the board. The flat panel power supply voltage can also be selected with a onboard jumper.

3.4.1   DIP Switch Settings (SW1)

The DIP switch settings below can be use to configured the display resolution and flat panel data resolution. Also the flat panel type.

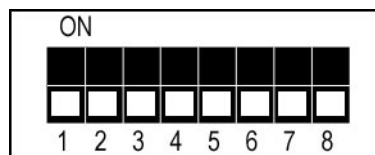**Figure 3-2 8-Way DIP Switch ALL OFF**

Switch No		Setup
1	Select LCD display type	ON: TFT
		OFF: DSTN
2	Select FP clock polarity	ON: FPCLK NORMAL
		OFF: FPCLK INVERTED
3,4	Select resolution	ON, ON: 640 x 480

5,6,7	TFT data resolution	ON, OFF: 800 x 600 OFF, ON: 1024 x 768 OFF, OFF: 1280 x 1024 ON, ON, ON: 9-bit TFT ON, ON, OFF: 12-bit TFT ON, OFF, ON: 18-bit TFT ON, OFF, OFF: 24-bit TFT OFF, ON, ON: 12-bit x 2 TFT OFF, ON, OFF: ANALOG TFT OFF, OFF, ON: 18-bit x 2 TFT
8	DSTN data resolution	ON: 16-bit DSTN OFF: 24-bit DSTN

Table 3-2 Hardware Setup

3.4.2   Flat Panel Power Selection (LK1)

The flat panel voltage level is selected via jumper located at LK1. The figures below shows the jumper position for 5 volt and 3.3 volt.
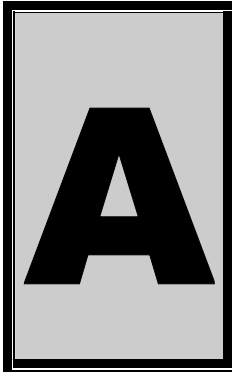

Figure 3-3 LK1 Flat Panel Power Jumper

Figure 3-4 5V Power Selection

Figure 3-5 3.3V Power Selection

A

A Specifications

A.1   Display Types & Resolution

Resolution: 640 x 480, 800 x 600, 1024 x 768, 1280 x 1024

Analog CRT: YES

DSTN: 16-bit & 24-bit up to 1024 x 768

TFT & LVDS: 3, 9, 12, 18, 24, 36 bit up to 1024 x 768

A.2   Video Memory

Location: On chip

Size: 4 mega byte

A.3   Video BIOS

Location: Onboard

Size: 512 kilo byte

Characteristics: Video initialization and power-on delay

LCD Communications Power On Delay: 50 ms

A.4   Display Panel Power

Voltage: Onboard 5V or 3V3 jumper selectable
                                                       Not fused

A.5   Peripheral Connector

Type: SCSI II DSUB 68 way male

Part Number: PCS-E68LMD

Mating Connector: FMD68FX

A.6   Bus Interface

Bus Type: PCI Mezzanine Card (PMC)
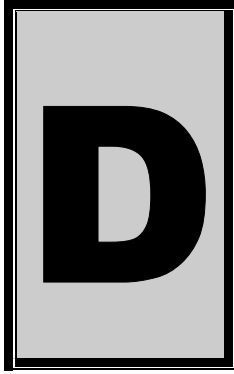
Compatibility: 32-bit PCI local bus specification revision 2.1

Voltage   3V3 or 5V

A.7   Power

Operating Supply Voltage: +3V3 ±5%

Maximum Operating Current: 330 mA

Maximum Power Consumption: 1 Watt

A.8   Environmental / Physical

Relative Humidity: 0% to 95% (non-condensing)

Operating Temperature: 0°C to 75°C

Storage Temperature: -40 °C to +125 °C

D

B Ordering Information

For ordering information please contact Eagle Technology directly or visit our website www.eagledaq.com. They can also be emailed at eagle@eagle.co.za.

Document History

The table below lists the document history. A minor revision change will indicate document errors that are edited. A major revision change will indicate an update or change to the document contents or structure.

Revision	Date	Comments
1.0	01/07/2005	Original Release