INDUSTRIAL COMPUTER SOURCE
TM

Model EMC-FDM
Product Manual

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INDUSTRIAL COMPUTER SOURCE

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FORWARD

This instruction manual provides the necessary user information for the referenced product(s) manufactured or distributed by Industrial Computer Source for the user to install, operate and/or program the product properly. Please refer to the following pages for information regarding the warranty and repair policies.

Technical assistance is available at (619) 271-9340.

Manual Errors, Omissions and Bugs: A Bug Sheet is included as the last page of this manual. Please use it if you find a problem with the manual you believe should be corrected.

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In order to receive a full refund of product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The RETURN PROCEDURE must be followed to assure prompt refund.

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Product returned after 30 days, and before 90 days, of the purchase will be subject to a minimum 20% restocking charge and any charges for damaged or missing parts.

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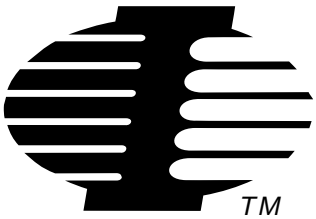

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Return Procedure

For any Limited Warranty or Guarantee return, every product returned to Industrial Computer Source for service or credit must be accompanied by a Return Material Authorization (RMA) Number, obtained from Industrial Computer Source Customer Service, **(619) 271-9340**, prior to its return. Freight on all returned items must be prepaid by the customer and customer is responsible for any loss or damage caused by common carrier in transit. Returns for warranty must include a failure report for each unit, by serial number as well as a copy of the original invoice showing date of purchase.

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Some sales items and custom systems are not subject to the guarantee and limited warranty. However in these instances , any deviations will be disclosed prior to sales and noted in the original invoice. ***Industrial Computer Source reserves the right to refuse returns or credits on software or special order items.***

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Chapter 1: Product Description

This manual contains the information required to install and use the EMC-FDM floppy drive expansion module.

The EMC-FDM is a floppy disk unit and also includes a standard male 9-pin serial port and a standard female 25-pin parallel port.

Due to the size of the floppy drive unit, the EMC-FDM uses a double-wide EXM form factor. The EMC-FDM is the same size as the EMC-PS50 unit, and is designed to mount on the right side (opposite the EMC-PS50) of an EMC chassis. One such chassis available from Industrial Computer Source is the EMC-CH6D.

The EMC-FDM is fully software configurable via the setup screen allowing the user to enable or disable the card and configure the I/O address and interrupt level for each port.

WARNING!

Do not plug in any cable or connector into the front panel connectors while the EMC-FDM is powered up. This unit is not designed to withstand potential damage that could arise from fluctuations in power. Never plug in a serial or parallel device, keyboard, transceiver, or other component while the system is turned on.

Specifications

The following table defines the environmental and electrical specifications of the EMC-FDM.

Charateristics		Value
Environmental Specifications		
Temperature	operating	0 to 45°C ambient
	storage	-40 to 65°C
Humidity	operating	20% to 80% non condensing
	storage	5% to 95% non condensing
Vibration	operating	.015"PP 0.6g (max) 5-2000 Hz
	storage	.030"PP 5g (max) 5-2000 Hz
Shock	operating	5g 11ms duration
	storage	50g 11ms duration
Electrical Specifications		
	typical	+5V @ 1.7 A with floppy drive running
	maximum	+5V @ 1.0 A (floppy drive idle)

Table 1: EMC-FDM Environmental and Electrical Specifications

* Upper temperature limit degrades 2° C per 1000 ft. elevation. Maximum elevation 10,000 ft.

Chapter 2: Installation

Before installing the EMC-FDM, unpack and inspect it for shipping damage.

- Do not remove the module from its anti-static bag unless you are in a static-free environment. The EMC-FDM, like most other electronic devices, is susceptible to ESD damage. ESD damage is not always immediately obvious, in that it can cause a partial breakdown in semiconductor devices that might not immediately result in a failure.

- Ensure that the installation process as described herein is also performed in a static-free environment.

Insertion in an EMC Chassis

Insertion of the EMC-FDM into an EMC chassis is straightforward. Locate the double-wide open card guides at the far right of the carrier (opposite the power supply) and insert the EMC-FDM into the backplane connector. Firmly press the EMC-FDM front panel to ensure that the module is properly seated in the backplane, then secure it with the supplied screws and nylon washers.

- Make sure that power to your system is off. The EMC-FDM is not designed to be inserted or removed from a live system.

- When inserting the EMC-FDM, avoid touching the circuit board, and make sure the environment is static-free.

- Insert it with adequate continuous force rather than tapping or hammering on it.

Configuring the BIOS Setup

The EMC-FDM is electrically an EXM device, and is configured like any other EXM module.

The configuration data in the EPC to which the EMC-FDM is connected needs to be modified to recognize and enable the module. After installing the module, turn on the system and boot it up. From the command line, invoke the BIOS setup function by pressing the CTRL-ALT-ESC keys simultaneously.

Enabling the EMC-FDM Module

Once in the setup function, a menu displays specifying which function keys are available for further configuration. Press the F2 function key to invoke the EXM Setup Screen. Information similar to the screen shown in Figure 1 below displays:

	ID	OB1	OB2
Slot 0	FF	00	00
1	EC	01	00
2	**7C**	**E1**	**00**
3	DC	F5	00
4	F5	05	00
5	FA	25	00

Figure 1: EXM Setup Screen

This screen displays the EXM configuration data (in hexadecimal) stored in nonvolatile memory. The EPC uses this information at power-up to recognize and configure each installed EXM. The displayed data shows SLOT, ID, OB1 and OB2 information. These are defined as follows:

SLOT Indicates the slot in which the EXM is installed. See Figure 2 below to determine which slot the EXM occupies.

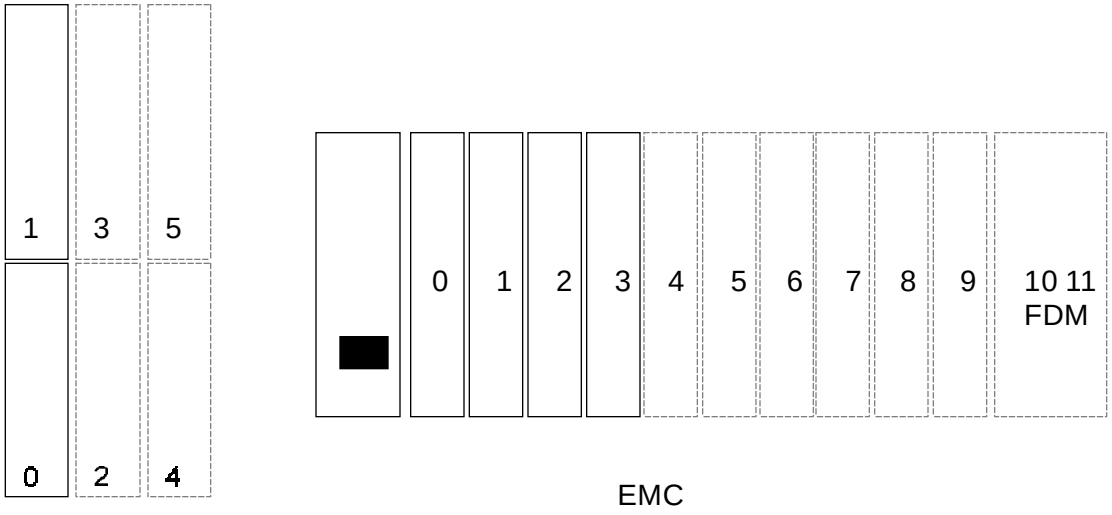

Figure 2: EXM Slot Numbering

The EMC-FDM occupies the two open slots on the far right of the chassis.

ID is a hard-wired ID value. Each EXM type has a unique ID value.

OB1/OB2 are two bytes of option information.

Note that all slots are listed even if the system configuration does not have all the possible EXM slots. All slots not occupied by an EXM module should show an ID of FF and OB1/OB2 of 00 00 indicating that no EXM is present.

To add or change an EXM configuration, use the cursor keys (arrows) to move between the fields on the screen. Move the cursor to the appropriate slot entry and type in the correct value.

The **ID** for the EMC-FDM should be set to **7C**.

OB1 is defined as follows:

Parallel Port I/O Enable	Parallel Port Enable	Printer Port Select	COM Port Interrupt	COM Port Base Address	Card Enable
(bit 7)	(bit 6)	(bit 5)	(bits 4, 3)	(bits 2, 1)	(bit 0)
1 = Enable ouput	1 = Enable	1 = 378 IRQ7	00 = Disabled	00 = Disabled	1 = Enable card
0 = Enable input	0 = Disable	0 = 278 IRQ5	01 = IRQ3	01 = 2F8h	0 = Disable card, IRQs
			10 = IRQ4	10 = 3E8h	
			11 = IRQ9(2)	11 = 2E8h	

Table 2: OB1 Register.

Parallel port In/Out - Normally set to 1 to enable output to the parallel port. Set to 0 to input data from a parallel device such as a scanner. Note that the DIR bit, which is bit 5 of register 27Ah or 37Ah, must be set to 1 via application software before the parallel port accepts input. Bit 7 has no effect when bit 6 = 0.

Parallel port enable - If 0, disables the parallel port registers and interrupt. A value of 1 enables the port.

Printer port select - If set to 1, selects a base address for the parallel port of 378h (LPT1:) and interrupt IRQ7. If clear, selects 278h and IRQ5.

COM port interrupt select - Encoded as follows:

00 Disabled. COM port uses no interrupt but can be written to.
01 Use IRQ3 (this is normally COM2)
10 Use IRQ4 (this is normally COM1)
11 Use IRQ9

COM port base address and enable - Encoded as follows:

00 Disabled. COM port will not respond.
01 Base address 2F8. This is normally COM2.
10 Base address 3E8. This is normally COM3.
11 Base address 2E8. This is normally COM4.

Card enable - CDEN must be set to 1 to enable the EMC-FDM. Note that setting CDEN to 0 disables all access to the registers, as well as disabling all interrupts.

OB2 is defined as follows:

	Reserved	Floppy Drive Enable
(bits 7-2)	(bit 1)	(bit 0)
111111	1 = default	1 = Enable floppy drive, DRQ and IRQ
		0 = Disable floppy drive

Table 3: OB2 Register

Bit 1 - Reserved for future use.

Floppy Drive Enable - Use to enable or disable the floppy drive. Please note that only one floppy drive controller per system can be enabled at any one time. If the EMC system requires an EXM-16 or an EXM-MX running with the EXM-FDM, disable all but one floppy drive.

Floppy Drive Setup

Refer to the pertinent EPC manual for a detailed description of how to change the configuration information stored in battery-backed RAM. In most cases, invoke the BIOS setup function by using CTRL-ALT-ESC from the DOS command prompt. Be sure to define drive A: as a 1.44M 3.5 inch drive.

Port Conflicts

Avoid interrupt and address conflicts due to multiple serial or parallel ports with the same address or interrupt. Be sure to either disable unused serial or parallel ports, or set them to a value that does not conflict with other ports in the system.

Note that in general attaching a mouse to a serial port only works on COM1 or COM2.

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Chapter 3: Operation

The EMC-FDM provides a 3.5" floppy disk drive and controller and both a standard 25-pin parallel port and a 9-pin DTE serial port. Both ports are implemented using a single VLSI VL16C452 chip. The VL16C452 provides two serial channels, channel 0 and channel 1. Channel 0 is not used.

This chip does not support HDLC and SDLC protocols. For detailed programming information, see the appropriate VLSI Technology data manual.

The floppy disk is controlled by a 37C65C floppy disk controller, identical to other Industrial Computer Source products.

The floppy drive supports both 1.44 Mbyte and 720 Kbyte 3.5" diskettes. The drive select is set as the A: drive.

Connectors

The parallel printer port is a standard female DB-25 with the pin-out defined as follows:

Pin	Signal	Pin	Signal
1	Strobe	14	Auto Line Feed
2	D0	15	Error
3	D1	16	Initialize Printer
4	D2	17	Select In
5	D3	18	Signal Ground
6	D4	19	Signal Ground
7	D5	20	Signal Ground
8	D6	21	Signal Ground
9	D7	22	Signal Ground
10	Acknowledge	23	Signal Ground
11	Busy	24	Signal Ground
12	Paper End	25	Signal Ground
13	Select		

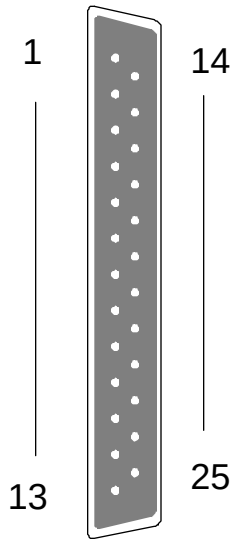

Table 4: DB-25 parallel port pinout.

The serial port is a standard male DB-9 connector. The pin-out of the serial port is shown below.

Pin	Signal	Pin	Signal
1	CD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	Ground		

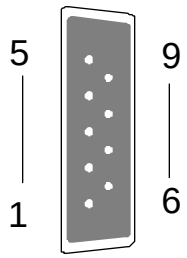

Table 5: DB-9 serial port pinout.

BUG REPORT

While we have tried to assure this manual is error free, it is a fact of life that works of man have errors. We request you to detail any errors you find on this BUG REPORT and return it to us. We will correct the errors/problems and send you a new manual as soon as available. Please return to:

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Product: **EMC-FDM**

Manual Revision: **41417-159-2A**

Please list the page numbers and errors found. Thank you!