



INDUSTRIAL COMPUTER SOURCE[®]

Model COMM4AT Product Manual

MANUAL NUMBER : 00750-106-14B



INDUSTRIAL COMPUTER SOURCE[®]



<http://www.indcompsrc.com>

6260 SEQUENCE DRIVE, SAN DIEGO, CA 92121-4371 (619) 677-0877 (FAX) 619-677-0895

INDUSTRIAL COMPUTER SOURCE EUROPE TEL (1) 69.18.74.40 FAX (1) 64.46.40.42 • INDUSTRIAL COMPUTER SOURCE (UK) LTD TEL 01243-533900 FAX 01243-532949

FORWARD

This product manual provides information to install, operate and or program the referenced product(s) manufactured or distributed by Industrial Computer Source. The following pages contain information regarding the warranty and repair policies.

Technical assistance is available at: **1-800-480-0044**.

Manual Errors, Omissions and Bugs: A "Bug Sheet" is included as the last page of this manual. Please use the "Bug Sheet" if you experience any problems with the manual that requires correction.

NOTE

The information in this document is provided for *reference* only. Industrial Computer Source does not assume any liability arising out of the application or use of the information or products described herein. This document may contain or reference information and products protected by copyrights or patents and does not convey any license under the patent rights of Industrial Computer Source, nor the rights of others.

Copyright © 1995 by Industrial Computer Source, a California Corporation, 6260 Sequence Drive, San Diego, CA 92121-4371. Industrial Computer Source is a Registered Trademark of Industrial Computer Source. All trademarks and registered trademarks are the property of their respective owners. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

This page intentionally left blank

Guarantee

A thirty day money-back guarantee is provided on all **standard** products sold. **Special order products** are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only. Extended Warranty available. Consult factory.*

Refunds

In order to receive refund on a 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.

Restocking Charges

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.

Products not returned within 90 days of purchase, or products which are not in as-new and resaleable condition, are not eligible for credit return and will be returned to the customer.

Limited Warranty

One year limited warranty on all products sold with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser, for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within one year of purchase, Industrial Computer Source will repair or replace, at our option, any defective product. At any time after one year, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. Industrial Computer Source will service the warranty for all standard catalog products for the first year from the date of shipment. After the first year, for products not manufactured by Industrial Computer Source, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

The **Return Procedure** must be followed to assure repair or replacement. Industrial Computer Source will normally return your replacement or repaired item via UPS Blue. *Overnight delivery or delivery via other carriers is available at additional charge.*

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Industrial Computer Source or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Industrial Computer Source or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the owners' manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Industrial Computer Source reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.



Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by Industrial Computer Source.

Return Procedure

For any Limited Warranty or Guarantee return, please contact Industrial Computer Source's Customer Service at **1-800-480-0044** and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Industrial Computer Source for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who 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(s), as well as a copy of the original invoice showing date of purchase.

To reduce risk of damage, returns of product must be in an Industrial Computer Source shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Industrial Computer Source Customer Service at a nominal cost.

Limitation of Liability

In no event shall Industrial Computer Source be liable for any defect in hardware or software or loss or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Industrial Computer Source liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Industrial Computer Source or its authorized agent.

Some *Sales Items* and *Customized 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.***

Table of Contents

FOREWARD	iii
Guarantee	v
Limited Warranty	v
Return Procedure	vi
Limitation of Liability	vi
Chapter 1: Installation	1-1
Chapter 2: Address Selection	2-1
Chapter 3: Interrupt Selection	3-1
Chapter 4: Technical Description	4-1
Status Port	4-1
How to remain CE Compliant	4-2
Chapter 5: Specifications	5-1
CE Declaration of Conformity	

List of Figures

Figure 1: Address Table	2-1
Figure 2: DIP Switch SW1	2-1
Figure 3: Connector/Port Correlation	2-2
Figure 4: IRQ Header E1	3-1
Figure 5: Status Port	4-1
Figure 6: Connector Pin Out	4-2

Current Revision 14B

August 1997

This page intentionally left blank

Chapter 1: Installation

The COMM4AT board can be installed in any of the PC expansion slots. First you must set the board base address and IRQ jumper. Remove the PC case, remove the blank metal slot cover, and insert the board. Replace the screw, replace the cover, and then install the DB-37 connector (spider cable) to the board.

Note: Be sure to set the address and jumper options before installation.

This page intentionally left blank

Chapter 2: Address Selection

The COMM4AT board occupies 32 consecutive I/O locations. The dip switch is used to set the base address for these locations. Be careful when selecting the base address as some selections conflict with existing PC ports. The following table shows several examples that usually do not cause a conflict.

Address	Switch Position Settings							
	1	2	3	4	5	6	7	8
280-29F	ON	ON	ON	OFF	ON	OFF	ON	ON
2A0-2BF	ON	ON	ON	OFF	ON	OFF	ON	OFF
380-39F	ON	ON	ON	OFF	OFF	OFF	ON	ON
3A0-3BF	ON	ON	ON	OFF	OFF	OFF	ON	OFF
1A0-1BF	ON	ON	ON	ON	OFF	OFF	ON	OFF
2E0-2FF	ON	ON	ON	OFF	ON	OFF	OFF	OFF
580-59F	ON	ON	OFF	ON	OFF	OFF	ON	ON
500-51F	ON	ON	OFF	ON	OFF	ON	ON	ON

Figure 1: Address Table

Note that 3A0-3BF cannot be used if the monochrome adaptor is installed, as port contention will result. The 2E0-2FF setting in conjunction with the IRQ3 interrupt selection will let the PC recognize COM2: (2F8) as well as COM4: (2E8).

XENIX Note: If you do not have a COM1: installed, use base address 500 hex and IRQ 4 (XENIX COM1:). If you already have a COM1: installed, then select 580 hex as a base address and IRQ 3 (XENIX COM2:).

The following table shows the correlation between the dip switch setting and the address bits used to determine the base address.

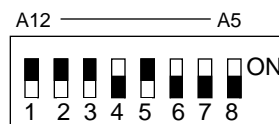


Figure 2: DIP Switch SW1

Note that setting the switch on or closed corresponds to a “0” in the address, while leaving it open or off corresponds to a “1”.

The following table shows which port is connected to which connector and the corresponding address.

Port#	DB-25 Connector	Address	BASE = 280H
1	1	BASE+0	280-287 HEX
2	2	BASE+8	288-28F HEX
3	3	BASE+16	290-297 HEX
4	4	BASE+24	298-29F HEX

Figure 3: Connector/Port Correlation

Chapter 3: Interrupt Selection

The COMM4AT board has an interrupt selection jumper which may have to be set prior to use. The software you are using with the board will determine which interrupt, if any, is to be used. The DOS interface software does not use interrupts, while interrupt buffer programs do. DOS and BASIC do not require the interrupt to be set, while most multi-user operating systems will. Consult the particular manual for the software that you are using to determine the proper setting.

To set the interrupt, place one of the jumpers on the header (E1) location that corresponds to the IRQ number that you wish to use. Refer to Figure 4.

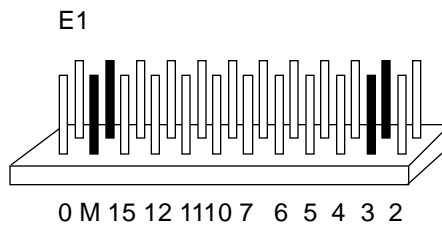


Figure 4: IRQ Header E1

Also located on header E1 is a multiple interrupt jumper selection. This is enabled by placing a jumper on the position labeled “M”(see Figure 1). This option should be selected on only one board when two or more boards are using the same interrupt line. If there is only one COMM4AT installed, this option must be selected.

Jumper option “O” on header E1 provides a unique anti-lockup feature. Most software will not require this option. The purpose of this jumper is to provide a “pulsed” interrupt request line in the event of a lockup due to mishandling of the hardware during an interrupt service routine. Again, well written, debugged interrupt drivers do not have this problem. The interrupt request lines on the PC are rising edge triggered. If more than one port is asserting an interrupt on the same IRQ line, both ports must be serviced in order for the IRQ line to return to the low level. If only one port is serviced, the line will remain high, and prevent further edges from triggering an interrupt, thus locking up the communications interrupt handler routine. If you are experiencing a similar problem, try installing the “O” jumper, and consult Industrial Computer Source’s technical support staff.

This page intentionally left blank

Chapter 4: Technical Description

The COMM4AT utilizes the 16550 UART. This chip features programmable baud rate, data format, and interrupt control. The 16550 also contains a 16 byte FIFO buffer.

The COMM4AT board is configured as four consecutively addressed UARTS with full RS-232C signal drivers and receivers. The connector pinout is identical to the standard PC ASYNC adaptor pinout (see Figure 6). The four interrupts are OR'ed together to form a single interrupt request (IRQ). This signal is converted to "active high pull-up" allowing multiple COMM4AT boards to share the same IRQ line.

Status Port

The Industrial Computer Source COMM4AT also provides the user with an interrupt status register for greater throughput when you are servicing multiple ports on a single interrupt line. The interrupt status register is a read only 8-bit register that sets a corresponding bit when an interrupt is pending. Port 1 interrupt line corresponds with bit D0 of the status port, port 2 with bit D1, port 3 with bit D2, and port 4 with bit D3. Bits D4-D7 of the status port are not used and will return zeros. The status register allows your system to reduce the amount of polling required to service up to four ports.

The status port is located at Base+7 on each port (example: base = 280 hex, status port = 287, 28F, 297, and 29F hex). This allows any one of four locations to be for read the value in the status register. All four status ports on the card are identical, so any one of the four can be read.

Example: This indicates that channel 2 has an interrupt pending.

Bit Position	7	6	5	4	3	2	1	0
Value Read	0	0	0	0	0	0	1	0

Figure 5: Status Port

Signal	Name	DB-25 Pin#	Mode
TD	Transmit Data	2	Output
RD	Receive Data	3	Input
RTS	Request to Send	4	Output
CTS	Clear to Send	5	Input
DSR	Data Set Ready	6	Input
GND	Ground	7	
CD	Carrier Detect	8	Input
DTR	Data Terminal Ready	20	Output
RI	Ring Indicator	22	Input

Figure 6: Connector Pin Out

How to remain CE Compliant

In order for machines to remain CE compliant, only CE compliant parts may be used. To keep a chassis compliant it must contain only compliant cards, and for cards to remain compliant they must be used in compliant chassis. Any modifications made to the equipment may affect the CE compliance standards and should not be done unless approved in writing by Industrial Computer Source.

The Model COMM4AT is designed to be CE Compliant when used in an CE compliant chassis. Maintaining CE Compliance also requires proper cabling and termination techniques. The user is advised to follow proper cabling techniques from sensor to interface to ensure a complete CE Compliant system. Industrial Computer Source does not offer engineering services for designing cabling or termination systems. Although Industrial Computer Source offers accessory cables and termination panels, it is the user's responsibility to ensure they are installed with proper shielding to maintain CE Compliance.

Chapter 5: Specifications

Environmental Specifications

Specification	Operating	Storage
Temperature Range	0° to 50° C 32° to 122° F	-20° to 70° C -40° to 158° F
Humidity Range	0 to 90% R.H Non-Condensing	0 to 90% R.H Non-Condensing

Power Consumption

Supply Line	12	-12	+5Vdc
Rating (mA)	50mA	50mA	135mA

Mean Time Between Failure

Greater than 150,000 hrs

Manufacturing Specifications

- IPC 610-A Class-III standards adhered to with 0.1 visual A.Q.L. and 100% Functional Testing
- Boards are built to U.L. rating and are 100% Electrically tested. Boards are solder mask over bare copper mask over tin nickel.

Communications Chip

16550 UART

Number of Ports

Four ports RS-232

Maximum Data Rate

20K bps @ 50ft per sec.
Higher rates attainable at shorter distances

Maximum Data Distance

Up to 100ft

This page intentionally left blank

Declaration of Conformity



6260 Sequence Drive
San Diego, CA 92121-4371
(800) 523-2320

Industrial Computer Source declares under its own and full responsibility that the following products are compliant with the protection requirements of the 89/336/EEC directives.

Only specific models listed on this declaration and labeled with the CE logo are CE compliant.

COMM4AT

Conformity is accomplished by meeting the requirements of the following European harmonized standards:

EN 50082-1:1992	EMC Generic Immunity Standard
EN 55022:1987	Limits & Methods of measurement of interference characteristics of IT Equipment
EN 60 950	Safety of Information Technology Equipment Including Electrical Business Equipment

Information supporting this declaration is contained in the applicable Technical Construction file available from:



Z.A. de Courtaboeuf
16, Avenue du Québec
B.P. 712
91961 LES ULIS Cedex

Mr. Steven R. Peltier
President & Chief Executive Officer

August 29, 1997
San Diego, CA

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:



INDUSTRIAL COMPUTER SOURCE®

Attn: Documentation Department

P. O. Box 910557

San Diego, CA 92121-0557

Your Name: _____

Company Name: _____

Address 1: _____

Address 2: _____

Mail Stop: _____

City: _____ State: _____ Zip: _____

Phone: (____) _____

Product: **COMM4AT**

Manual Revision: **00750-106-14B**

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

