



IQEXTENDER IQ Module

Board Manual

March 1998

Order Number: **272942-002**





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Copies of documents which have an ordering number and are referenced in this document, or other Intel literature may be obtained by calling 1-800-548-4725 or by visiting Intel's website at <http://www.intel.com>.

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1.1 Overview

The Product Name extends the secondary PCI bus to three standard PCI connectors. Users can prototype Intelligent I/O systems with off-the-shelf PCI I/O boards. The Product Name may be hosted on an Intel IQ80960RP or IQ80960RD66 cards.

1.2 Features

- Three PCI slots connected to the secondary PCI bus
- Logic Analyzer test leaders for all secondary PCI bus signals

1.3 Specifications

Physical Characteristics:

Length x Width 7.000" x 7.900"

PCI boards mount horizontal

1.4 Related Information

1.4.1 Third-Party Vendor Contact Information

In addition to the printed technical documentation — the "traditional" collection of product information — Intel is providing technical (and other) information to you electronically via FaxBACK, Application Bulletin Board Service (BBS) and World Wide Web (WWW). The following subsections identify related technical information, sources for electronic file download, and technical support.

Table 1-1. Related Third-Party Information

| Company | Product | Contact |
|----------------------------|---|--|
| PCI Special Interest Group | <i>PCI Local Bus Specification</i> Revision 2.1 | (503) 797-4207 (International) (503) 234-6762 (Fax) |

1.4.2 Intel Documentation

Documentation is available from your local Intel Sales Representative or Intel Literature Sales:

Intel Corporation
Literature Sales
PO Box 5937
Denver, CO 80217-9808
(800) 548-4725

Table 1-2. Related Intel Documentation

| Document Title | Order # |
|--|---------|
| <i>IQ80960RP Evaluation Platform User's Guide</i> | 272913 |
| <i>i960[®] RP Microprocessor User's Manual</i> | 272736 |
| <i>80960RP the IQ Series Intelligent I/O Microprocessor data sheet</i> | 272737 |

1.4.3 "Electronic" Information

Up-to-date product and technical information is available electronically from these sources:

Table 1-3. Related Electronic Information

| | |
|--|---|
| Intel's World Wide Web (WWW) Location: ¹ | http://www.intel.com/ |
| FaxBACK Service: | |
| US and Canada | 800-628-2283 |
| Europe | +44(0)793-496646 |
| Worldwide | 916-356-3105 |
| Application Bulletin Board Service: | |
| up to 14.4 Kbaud line, Worldwide | 916-356-3600 |
| dedicated 2400 baud line, Worldwide | 916-356-7209 |
| Europe | +44(0)793-496340 |

¹ Intel's presence on the WWW is evolving rapidly; file locations may have changed after this manual was printed. If you are not finding the desired information, contact Customer Support for assistance.

1.4.4 Intel Customer Support Contacts

Table 1-4. Intel Customer Support Telephone Numbers

| | | |
|--|---------------------------|--|
| Customer Support (US and Canada): | | 800-628-8686 |
| | | |
| Country | Literature | Technical Support |
| Australia National Sydney | Contact Local Distributor | 008-257-307 61-2-975-3300 61-3-810-2141 |
| Belgium, Netherlands, Luxembourg | 010-4071-111 | 010-4071-111 |
| Canada | 800-468-8118 | Contact Local Distributor |
| Finland | 358-0-544-644 | 358-0-544-644 |
| France | 33-1-30-57-70-00 | 33-1-30-57-72-22 |
| Germany | 49-89-9-099-2257 | Hardware:49-89-903-8529 Software:49-89-903-2025 |
| Israel | 972-3-498080 | 972-3-548-3232 |
| Italy | 39-02-89200950 | 39-02-89200950 |
| Japan | Contact Local Distributor | 0120-1-80387 |
| Sweden | 46-8-7340100 | 46-8-7340100 |
| United States | 800-548-4725 | 800-628-8686 |

2.1 Installation On A Host

Warning: Static discharge can severely damage integrated circuits. The host board and IQEXTENDER IQ Module should only be handled with proper static protection. IQEXTENDER IQ Modules should always be installed with power to the host board OFF. Mounting or dismounting a module with the host power ON could permanently damage the circuitry on the module.

Refer to the IQEXTENDER IQ Module's host board user's manual for mounting locations.

To install the IQEXTENDER IQ Module (Figure 2-1) proceed with the following steps:

1. Mount the I/O card panel onto the IQEXTENDER IQ Module board with two screws. The panel mounts on the same side as the PCI connectors on the IQEXTENDER IQ Module.
2. Align the module and host connectors.
3. With the module and host aligned, press the two assemblies together, fully mating the connectors.
4. Secure the IQEXTENDER IQ Module to the host with the four nylon screws.

Figure 2-1. IQEXTENDER IQ Module Installation on Host

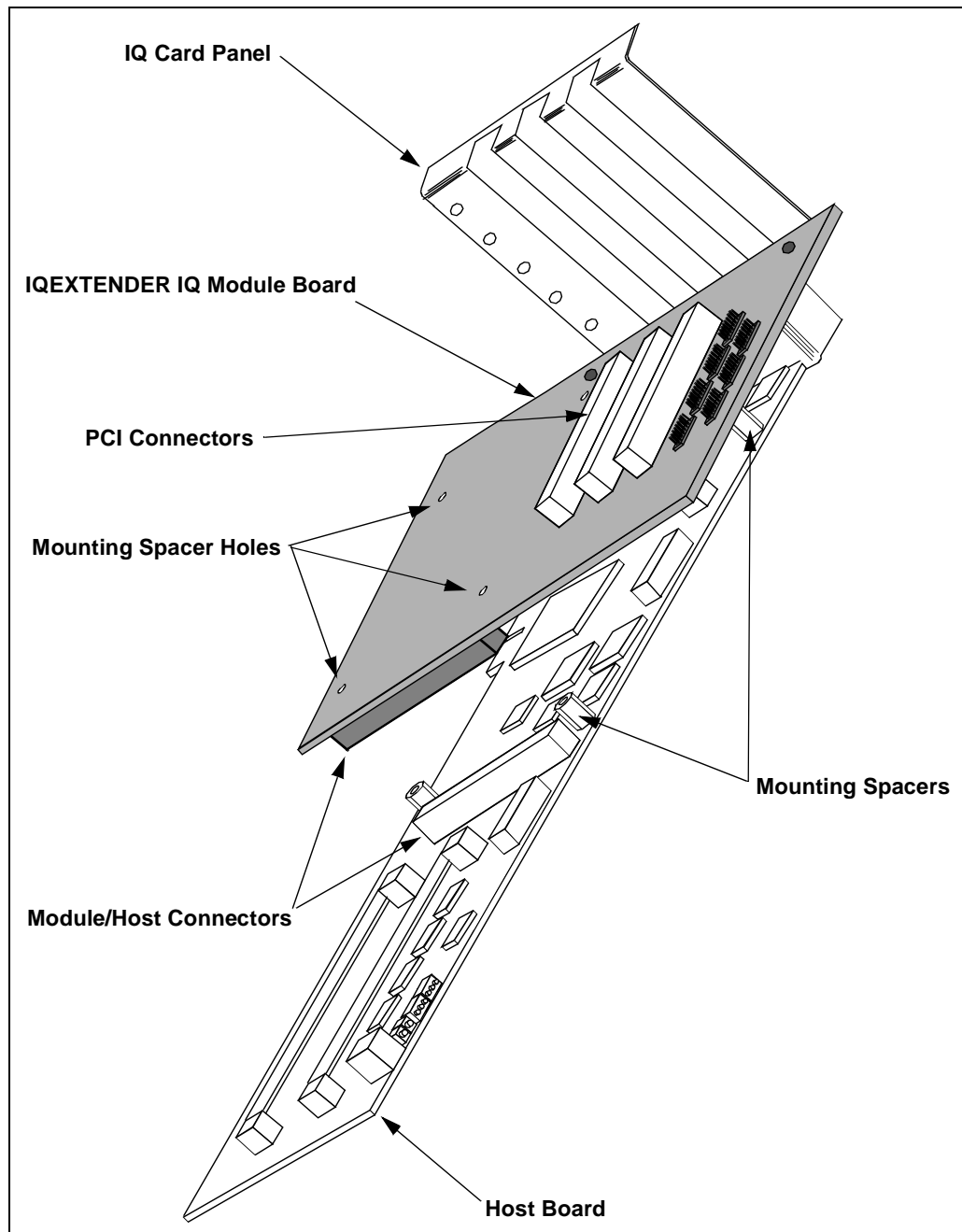
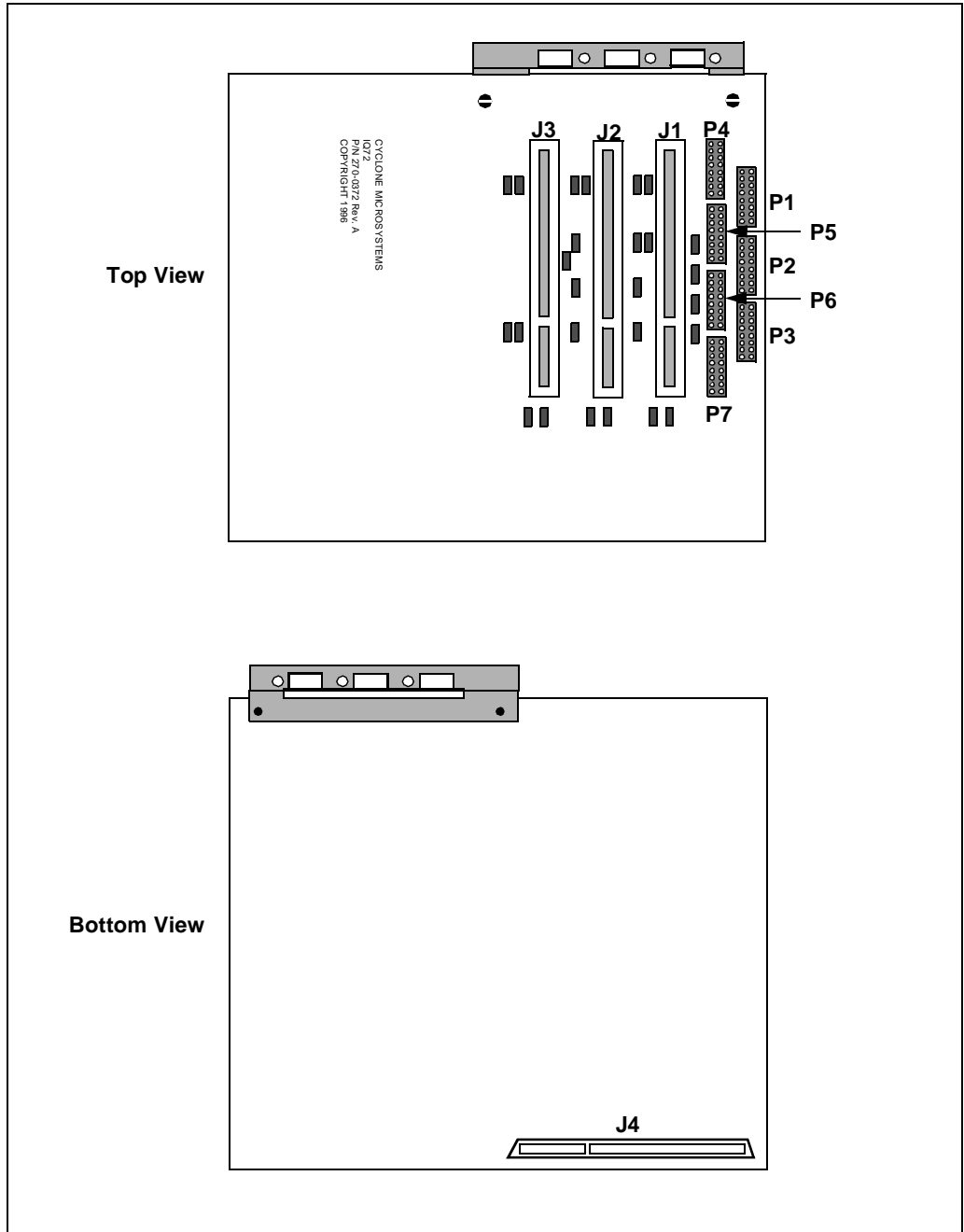


Figure 2-2. IQEXTENDER IQ Module



3.1 Introduction

This chapter describes the hardware and general operation of the IQEXTENDER IQ Module. The module extends the secondary PCI bus to three standard PCI connectors and logic analyzer test leaders.

3.2 PCI ExpansionN Slots

Three PCI Expansion Slots are available on the IQEXTENDER IQ Module. The slots are designed for +5 V PCI signalling and accommodate PCI cards with +5 V or universal signalling capabilities.

3.3 PCI Slots Power Availability

The IQEXTENDER IQ Module routes +5 V, +12 V, -12 V and +3.3 V to the PCI slots from the IQ Module connector. A positive 3.3 V is not supplied by any of the current host boards (Intel's IQ80960RP or Cyclone's PCI914 boards) to the IQ Module connector. As per the *PCI Local Bus Specification* Revision 2.1, the +3.3 V pins are used as AC return paths.

3.4 Interrupt and IDSEL Routing

Secondary PCI bus interrupts and IDSEL are signals routed as shown in [Table 3-1](#).

Table 3-1. Secondary PCI Bus Interrupt and IDSEL Routing

| Connector | IDSEL | INTA# | INTB# | INTC# | INTD# |
|-----------|-------|---------|---------|---------|---------|
| J1 | A18 | S_INTC# | S_INTB# | S_INTA# | S_INTD# |
| J2 | A17 | S_INTB# | S_INTA# | S_INTD# | S_INTC# |
| J3 | A16 | S_INTA# | S_INTD# | S_INTC# | S_INTB# |

3.5 IQEXTENDER IQ Module Board Bill of Materials

Table 3-2. IQEXTENDER IQ Module Bill of Materials

| Qty. | Part Description | Manufacturer P/N Reference | Component Location |
|------|-------------------------------------|----------------------------|------------------------|
| 3 | 5 V Through Hole PCI Slot Connector | AMP #145154-4 | J1, J2, J3 |
| 1 | 120-Pin Connector (Receptacle) | AMP #176372-5 | J4 |
| 7 | 16-Pin (2x8) Header | Molex #10-89-6168 | P1 - P7 |
| 15 | 0.1 μ F (1206) Capacitor | Generic | C1 - C15 |
| 3 | 000 Ω , 5% (1206) Resistor | Generic | R1, R3, R7 |
| 6 | 10 K Ω , 5% (1206) Resistor | Generic | R2, R4, R5, R6, R8, R9 |
| 2 | 2.7 K Ω , 5% (1206) Resistor | Generic | R10, R11 |

3.6 Pin Assignments

This chapter gives the pin assignments to the logic analyzer headers.

Table 3-3. Logic Analyzer Header P1

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | AD31 | 2 | GND |
| 3 | AD30 | 4 | GND |
| 5 | AD29 | 6 | GND |
| 7 | AD28 | 8 | GND |
| 9 | AD27 | 10 | GND |
| 11 | AD26 | 12 | GND |
| 13 | AD25 | 14 | GND |
| 15 | AD24 | 16 | GND |

Table 3-4. Logic Analyzer Header P2

| Pin | Signal | Pin | Signal |
|-----|---------|-----|--------|
| 1 | C/BE3# | 2 | GND |
| 3 | C/BE2# | 4 | GND |
| 5 | FRAME# | 6 | GND |
| 7 | IRDY# | 8 | GND |
| 9 | TRDY# | 10 | GND |
| 11 | DEVSEL# | 12 | GND |
| 13 | STOP# | 14 | GND |
| 15 | LOCK# | 16 | GND |

Table 3-5. Logic Analyzer Header P3

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | PERR# | 2 | GND |
| 3 | SERR# | 4 | GND |
| 5 | PAR | 6 | GND |
| 7 | C/BE1# | 8 | GND |
| 9 | C/BE0# | 10 | GND |
| 11 | N/C | 12 | GND |
| 13 | N/C | 14 | GND |
| 15 | N/C | 16 | GND |

Table 3-6. Logic Analyzer Header P4

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | INTA# | 2 | GND |
| 3 | INTB# | 4 | GND |
| 5 | INTC# | 6 | GND |
| 7 | INTD# | 8 | GND |
| 9 | CLKD | 10 | GND |
| 11 | RST# | 12 | GND |
| 13 | GNT3# | 14 | GND |
| 15 | REQ3# | 16 | GND |

Table 3-7. Logic Analyzer Header P5

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | AD23 | 2 | GND |
| 3 | AD22 | 4 | GND |
| 5 | AD21 | 6 | GND |
| 7 | AD20 | 8 | GND |
| 9 | AD19 | 10 | GND |
| 11 | AD18 | 12 | GND |
| 13 | AD17 | 14 | GND |
| 15 | AD16 | 16 | GND |

Table 3-8. Logic Analyzer Header P6

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | AD15 | 2 | GND |
| 3 | AD14 | 4 | GND |
| 5 | AD13 | 6 | GND |
| 7 | AD12 | 8 | GND |
| 9 | AD11 | 10 | GND |
| 11 | AD10 | 12 | GND |
| 13 | AD9 | 14 | GND |
| 15 | AD8 | 16 | GND |

Table 3-9. Logic Analyzer Header P7

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | AD7 | 2 | GND |
| 3 | AD6 | 4 | GND |
| 5 | AD5 | 6 | GND |
| 7 | AD4 | 8 | GND |
| 9 | AD3 | 10 | GND |
| 11 | AD2 | 12 | GND |
| 13 | AD1 | 14 | GND |
| 15 | AD0 | 16 | GND |