ACCES I/O PRODUCTS, INC.

MODEL IIB-24

24 CHANNEL OPTICALLY ISOLATED INPUT BOARD

USER MANUAL

FILE: MIIB-24.A2

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WARNING!!

ALWAYS CONNECT AND DISCONNECT YOUR FIELD CABLING WITH THE COMPUTER POWER OFF. ALWAYS TURN COMPUTER POWER OFF BEFORE INSTALLING A BOARD. CONNECTING AND DISCONNECTING CABLES, OR INSTALLING BOARDS INTO A SYSTEM WITH THE COMPUTER OR FIELD POWER ON MAY CAUSE DAMAGE TO THE I/O BOARD AND WILL VOID ALL WARRANTIES, IMPLIED OR EXPRESSED.

Warranty

Prior to shipment, ACCES equipment is thoroughly inspected and tested to applicable specifications. However, should equipment failure occur, ACCES assures its customers that prompt service and support will be available. All equipment originally manufactured by ACCES which is found to be defective will be repaired or replaced subject to the following considerations.

Terms and Conditions

If a unit is suspected of failure, contact ACCES' Customer Service department. Be prepared to give the unit model number, serial number, and a description of the failure symptom(s). We may suggest some simple tests to confirm the failure. We will assign a Return Material Authorization (RMA) number which must appear on the outer label of the return package. All units/components should be properly packed for handling and returned with freight prepaid to the ACCES designated Service Center, and will be returned to the customer's/user's site freight prepaid and invoiced.

Coverage

First Three Years: Returned unit/part will be repaired and/or replaced at ACCES option with no charge for labor or parts not excluded by warranty. Warranty commences with equipment shipment.

Following Years: Throughout your equipment's lifetime, ACCES stands ready to provide on-site or in-plant service at reasonable rates similar to those of other manufacturers in the industry.

Equipment Not Manufactured by ACCES

Equipment provided but not manufactured by ACCES is warranted and will be repaired according to the terms and conditions of the respective equipment manufacturer's warranty.

General

Under this Warranty, liability of ACCES is limited to replacing, repairing or issuing credit (at ACCES discretion) for any products which are proved to be defective during the warranty period. In no case is ACCES liable for consequential or special damage arriving from use or misuse of our product. The customer is responsible for all charges caused by modifications or additions to ACCES equipment not approved in writing by ACCES or, if in ACCES opinion the equipment has been subjected to abnormal use. "Abnormal use" for purposes of this warranty is defined as any use to which the equipment is exposed other than that use specified or intended as evidenced by purchase or sales representation. Other than the above, no other warranty, expressed or implied, shall apply to any and all such equipment furnished or sold by ACCES.

Table of Contents

Chapter 1: Introduction

This 24 channel optically isolated input board is designed to add capability to interface powered signals originating from equipment with different power sources to eliminate troublesome ground loops and circulating currents. While we offer up to 120 buffered digital I/O lines on a single PCI board in 5 groups of 24 for monitoring dry contacts and TTL interfacing, there is often a need to also interface powered status signals. Simply add in an IIB-24 to any 24 bit group and you've expanded your signal interface capability without needing to program a new device or find another open PCI slot or USB port.

Less than half the cost of a solid state module mounting rack with discrete input modules, and about a quarter size of the footprint, this add-on module will be hard to compete with for applications requiring some level of optical isolation or higher than TTL level signals.

The IIB-24 is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The board is PC/104 sized (3.550 by 3.775 inches). Easily mount the board on a DIN-rail using our MP104-DIN adaptor.

Features

- 24 optically isolated inputs
- Non-polarized inputs accept 31VDC or 24VAC
- Input isolation rated at 500V channel to channel and channel to ground
- Jumper-selectable filters per channel for AC inputs and to eliminate undesired response to electrically noisy DC signals
- Pairs with compatible 24-channel digital input boards
- On-board screw terminals
- Industry standard 50 pin keyed IDC connector
- Power for circuit isolation accepted from either pin-49 from host digital input connector or alternatively from power screw terminals
- LED indicates presence of +5VDC power for board operation
- PC/104 module size and mounting compatibility

Applications

Equipment status monitoring, "wet" contact and powered signal interfacing, SCADA, energy management systems, multiple supply equipment status and control and more. Any application requiring isolation to eliminate troublesome ground loops and circulating currents including legacy systems would benefit from this low-cost utility board.

Functional Description

The isolated, non-polarized inputs may be driven by either DC sources of 3-31 V (or higher by special order) or AC sources at frequencies of 40Hz to 10kHz. Optically isolating the digital inputs from each other, and from the computer, assures smooth, error-free data transmission in noisy, real-world environments. The input channels are accessed via screw terminals. The TTL input signals are connected to the DIO product via a 50-pin IDC type right angle header.

OEM USB/104 Form Factor

The OEM "board-only" version is perfect for a variety of embedded applications. What makes this approach unique is that its PCB size and mounting holes match the PC/104 form factor. This allows our rugged digital board to be added to any PCI-104 or PC/104 stack.
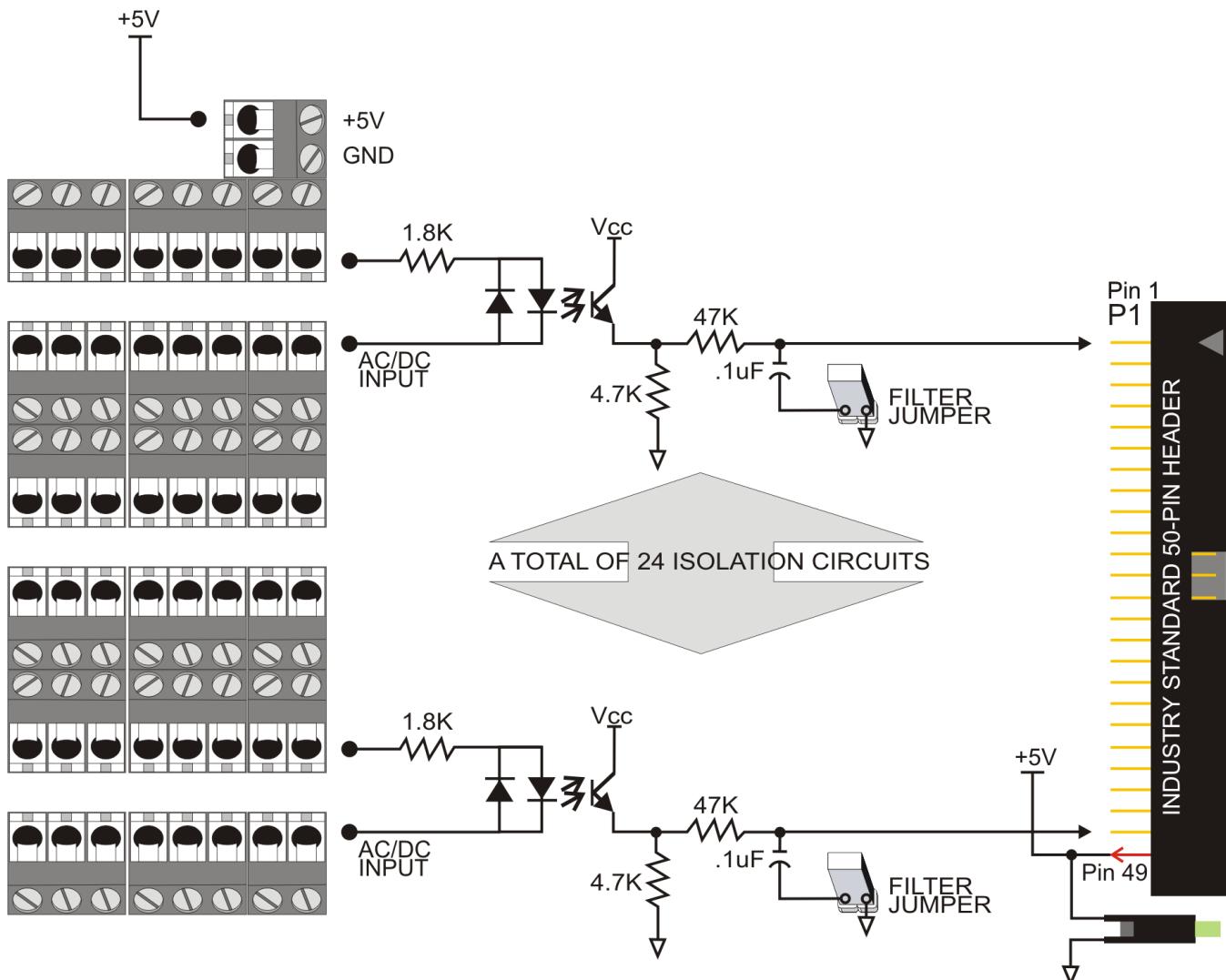
Figure 1-1: Block Diagram

Ordering Guide

IIB-24   24 channel isolated input to TTL output board

Special Order

Higher input voltages can be accommodated by changing the current limiting resistors. Other examples of special orders would be conformal coating, vertical I/O pin header instead of shrouded right-angle etc..

Included with your board

The following components are included with your shipment, depending on options ordered. Please take the time now to ensure that no items are damaged or missing.

- Isolated input board installed on standoffs
- Software Master CD

Optional Accessories

- MP104-DIN   Din-Rail mounting
- CAB50F-6   Ribbon Cable Assembly

Chapter 2: Installation

A printed I/O Quickstart Guide is normally included and packed with your hardware for shipment. There is no software required to use the isolated input to TTL board, so the only thing typically installed from our CD is this user manual.

Software CD Installation

The software provided with this board is contained on one CD and *must be installed onto your hard disk prior to use.* To do this, perform the following steps as appropriate for your operating system. Substitute the appropriate drive letter for your drive where you see d: in the examples below.

WINDOWS
1.   Place the CD into your CD-ROM drive.
2.   The install program should automatically run. If not click START | RUN and type
        ⎗D⎗:⎗I⎗N⎗S⎗T⎗A⎗L⎗L⎗, click OK or press ⎗Enter⎗.
3.   Follow the on-screen prompts to install the software for this board.

Installing the Adapter

Before installing the adapter, carefully read the OPTION SELECTION section of this manual and configure the adapter according to your requirements. In Windows, the SETUP.EXE program will lead you through the process of setting the options on the board. The setup program does not set the options. These must be set manually by jumpers on the board.

To Install the Adapter

Install jumpers as required for each option (filtering on, or no filtering on inputs) and as appropriate for how the TTL side of the board will be powered following either the Option Selection section of this manual or the suggestions of the SETUP.EXE software program.

Chapter 3: Hardware Details

Option Selection

To help you locate the jumpers described in this section, refer to the setup program installed from the provided CD. The board is also clearly silk-screened with all user interface components labeled with easy to understand designators.

Connectors, Indicators and Jumper Functions

LED
Indicates presence of +5V power on pin 49 of the I/O connector

Screw Terminals
24 pairs of screw terminals (A & B) allow connections of up to 24 discrete inputs

One additional pair of screw terminals labeled +5V and GND are provided to either supply power for the TTL side of the opto-isolator circuits, or as a means to use the +5V that is typically sourced from the I/O card 50-pin header.

Filter Jumpers
24 filter selection jumpers labeled FLT0 through FLT23 provide capability to add filtering to each input to eliminate undesired responses to noisy electrical signals and zero crossings of AC inputs.
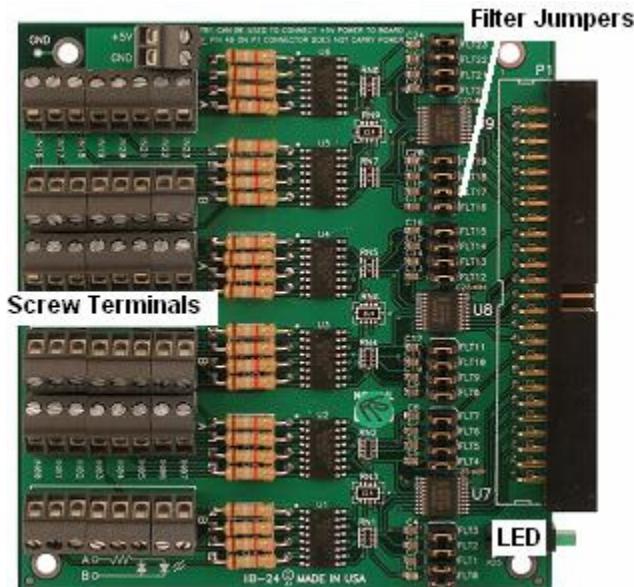

Figure 3-1: Board Image

Chapter 4: Connector Pin Assignments

Screw Terminal Input Connections

Each input signal connection is made at two screw terminals labeled "A" and "B". The input signal number corresponds to an Input Bit number 0 through 23.
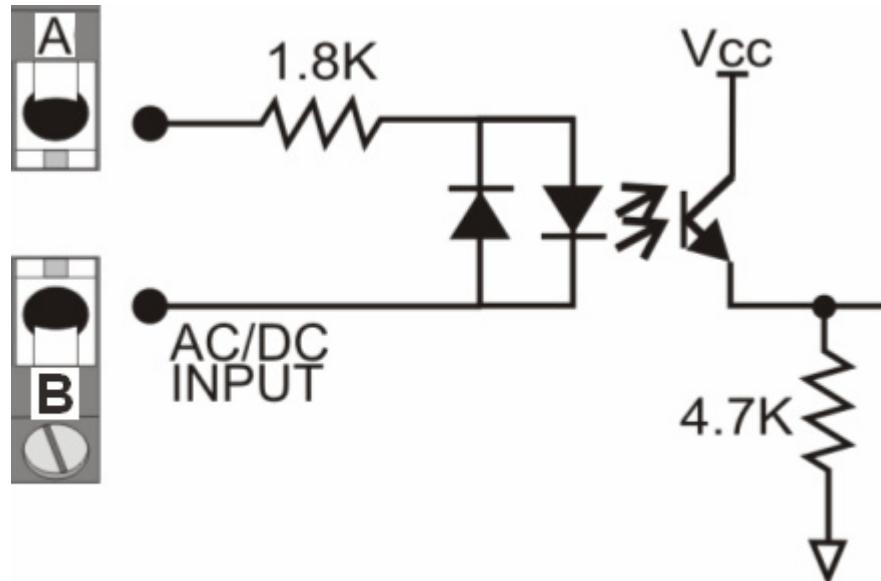
Figure 4-1: Input circuit diagram from screw terminal connections

Input/Output Connections

IDC 50-Pin Header Male

Pin	Signal	Pin	Signal
50		49	+5V FUSED
48		47	Input Bit 0
46		45	Input Bit 1
44		43	Input Bit 2
42		41	Input Bit 3
40		39	Input Bit 4
38		37	Input Bit 5
36		35	Input Bit 6
34		33	Input Bit 7
32	All Even Numbered Pins are Ground	31	Input Bit 8
30		29	Input Bit 9
28		27	Input Bit 10
26		25	Input Bit 11
24		23	Input Bit 12
22		21	Input Bit 13
20		19	Input Bit 14
18		17	Input Bit 15
16		15	Input Bit 16
14		13	Input Bit 17
12		11	Input Bit 18
10		9	Input Bit 19
8		7	Input Bit 20
6		5	Input Bit 21
4		3	Input Bit 22
2		1	Input Bit 23

Table 4-1: 50-pin input header connector pin assignments

Chapter 5: Specifications

Isolated Inputs

Channels:	24
Type:	Non-polarized
Voltage:	3 to 31 DC or AC RMS (40 Hz-10 kHz) CMOS compatible
Isolation:	500V* channel-to-ground and channel-to-channel
Resistance:	1.8K ohms in series with opto-coupler
Filter Response:	Rise Time = 4.7 mS / Fall Time = 4.7 mS
Non-Filter Response:	Rise Time = 10 uS / Fall Time = 30 uS

Environmental

Operating Temp:	0° to 70°C
Storage Temp:	-40° to +85°C
Humidity:	Maximum 90% RH, without condensation
Board Dimension:	3.550 x 3.775 inches
Box Dimension:	4.00 x 4.00 x 1.4 inches
Power:	5V@ 35mA, typical

Customer Comments

If you experience any problems with this manual or just want to give us some feedback, please email us at: *manuals@accesio.com*. Please detail any errors you find and include your mailing address so that we can send you any manual updates.

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