

PC104-DO48H

User's Guide



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1.0 INTRODUCTION

The PC104-DO48H is a digital output board.

The 'H' designation indicates that these boards are capable of 'High Drive'. High Drive TTL is capable of higher currents than standard TTL. A High Drive output is capable of supplying 15 mA and sinking 64 mA.

There is no control register to set the port direction from input to output. The PC104-DO48H boards are output only.

The PC104-DO48H conforms to the 50-pin connector pin specification of all CIO-DIO family of digital boards, so can be used in place of one another without changing cabling or connectors.

The board is supported by Universal Library programming library.

2.0 SOFTWARE INSTALLATION

The board has a variety of switches and jumpers to set before installing the board in your computer. By far the simplest way to configure your board is to use the *InstaCal*[™] program provided as part of your software package. *InstaCal*[™] will show you all available options, how to configure the various switches and jumpers (as applicable) to match your application requirements, and will create a configuration file that your application software (and the Universal Library) will refer to so the software you use will automatically know the exact configuration of the board.

Please refer to the *Extended Software Installation Manual* regarding the installation and operation of *InstaCal*[™]. The following hard copy information is provided as a matter of completeness, and will allow you to set the hardware configuration of the board if you do not have immediate access to *InstaCal*[™] and/or your computer.

3.0 HARDWARE SETUP

Open your PC (after turning off the power) and install the board. Leave the switches as they were set at the factory or refer to the information below to change the settings. After the board is installed and the computer is closed up, turn the power back on.

3.1 BASE ADDRESS

The PC104-DO48H employs the PC bus for power, communications and data transfer. As such it draws power from the PC, monitors the address lines and control signals and responds to it's I/O address, and it receives and places data on the data lines.

The BASE address is the most important user selectable bus related feature of the PC104-DO48H. The base address is the location that software writes to and reads from when communicating with the PC104-DO48H.

The base address switch is the means for setting the base address. Each switch position corresponds to one of the PC bus address lines. By placing the switch down, the PC104-DO48H address decode logic is programmed to respond to that address bit.

A complete address is constructed by setting the HEX or decimal number which the PC104-DO48H will respond to. In the example shown, switches 1 and 2 are DOWN, all others are UP.

Switch 1 = 200h (512D) and switch 2 = 100h (256D). Added together, they equal 300h (768D), the base address.

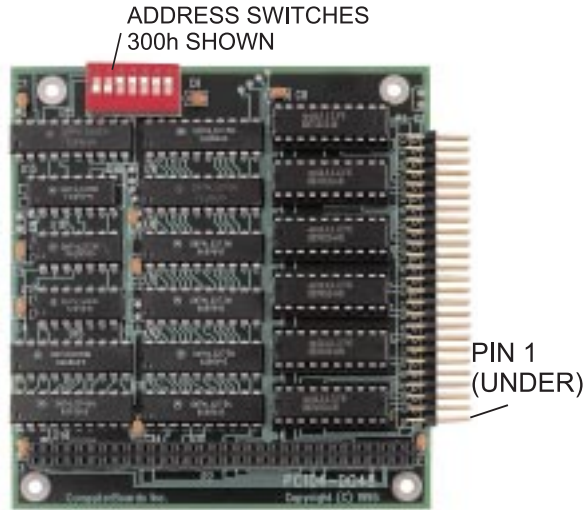


Figure 3-1. Address Switches and Pin 1 Locations

Certain addresses are used by the PC while others are free and can be used by the PC104-DO48 and other expansion boards. We recommend trying the factory default address, 300h (768D), first.

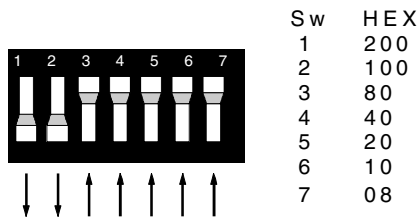


Figure 3-2. Base Address Switch Block - 300h Shown

The PC104-DO48H BASE switch may be set for address in the range of 000-3F8 so it should not be hard to find a free address area for your PC104-DO48H. Once again, if you are not using IBM prototyping cards or some other board which occupies these addresses, then 300-31F HEX are free to use. Refer to Table 3-1 below.

Addresses not specifically listed, such as 390-39F, are not reserved and may be available. Check your computer for other boards which may be using I/O addresses.

Table 3-1 PC I/O Addresses

HEX RANGE	FUNCTION	HEX RANGE	FUNCTION
000-00F	8237 DMA #1	2C0-2CF	EGA
020-021	8259 PIC #1	2D0-2DF	EGA
040-043	8253 TIMER	2E0-2E7	GPIB (AT)
060-063	8255 PPI (XT)	2E8-2EF	SERIAL PORT
060-064	8742 CONTROLLER (AT)	2F8-2FF	SERIAL PORT
070-071	CMOS RAM & NMI MASK (AT)	300-30F	PROTOTYPE CARD
080-08F	DMA PAGE REGISTERS	310-31F	PROTOTYPE CARD
0A0-0A1	8259 PIC #2 (AT)	320-32F	HARD DISK (XT)
0A0-0AF	NMI MASK (XT)	378-37F	PARALLEL PRINTER
0C0-0DF	8237 #2 (AT)	380-38F	SDLC
0F0-0FF	80287 NUMERIC CO-P (AT)	3A0-3AF	SDLC
1F0-1FF	HARD DISK (AT)	3B0-3BB	MDA
200-20F	GAME CONTROL	3BC-3BF	PARALLEL PRINTER
210-21F	EXPANSION UNIT (XT)	3C0-3CF	EGA
238-23B	BUS MOUSE	3D0-3DF	CGA
23C-23F	ALT BUS MOUSE	3E8-3EF	SERIAL PORT
270-27F	PARALLEL PRINTER	3F0-3F7	FLOPPY DISK
2B0-2BF	EGA	3F8-3FF	SERIAL PORT

4.0 HARDWARE INSTALLATION

Turn the power off.

Locate the PC104 expansion bus in your computer.

Push the board firmly down into the expansion bus connector. If it is not seated fully it may fail to work and could short circuit the PC bus power onto a PC bus signal. This could damage the motherboard in your PC or the board.

4.1 CABLING

The connector is a standard 50-pin header connector. A cable with mating connectors (C50FF-#) may be purchased from Measurement Computing Corporation.

Those familiar with the CIO-DIO##H boards will find the signal levels and pin assignments are identical with those on the PC104-DO48H.

4.2 SIGNAL CONNECTION

The PC104-DO48H signals are buffered (high output drive) STTL. STTL is an electronics industry term, short for Schotky Transistor Transistor Logic, which describes a standard for digital signals which are either near 0V or near 5V.

4.3 CONNECTOR DIAGRAM

The PC104-DO48H connector is a 50-pin header type connector (Figure 4-1). The signals available are direct connections to a digital buffer chip.

The connector accepts female 50-pin header type connectors, such as those on the C50FF-2, 2 foot cable with connectors.

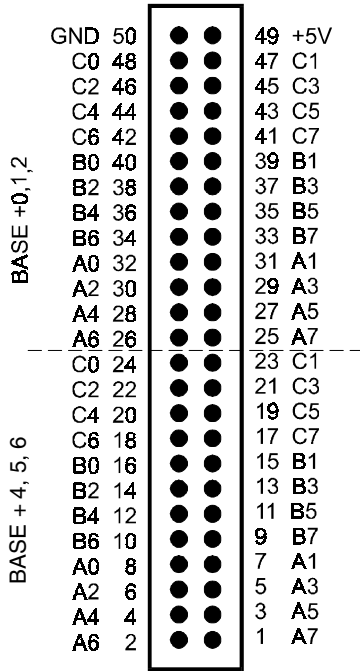


Figure 4-1. 50-Pin Connector

If frequent changes to signal connections or signal conditioning is required, please refer to the information on the CIO-TERM100, CIO-SPADE50 and CIO-MINI50 screw terminal boards.

5.0 CONTROL & DATA REGISTERS

Each PC104-DO48 is composed of parallel output chips. Each address contains one latch and one buffer controlling eight output pins. The ports are arranged in sets of three, with an intervening NA (not used) address. This scheme allows compatibility with software written to control 82C55 based boards when the 82C55 is used as all outputs. On those boards every fourth address contains a control register.

The first address, or BASE ADDRESS, is determined by setting a bank of switches on the board.

To write a control data to an output register, the individual bits must be set to 0 or 1 then combined to form a Byte.

The registers and their function are listed on the following table.

ADDRESS	READ FUNCTION	WRITE FUNCTION
BASE + 0, 4	None	Port A Output
BASE + 1, 5	None	Port B Output
BASE + 2, 6	None	Port C Output
BASE + 3, 7	None	None

There are two sets of digital output lines. Each set has 24 outputs that are divided into three ports of eight lines each. An 8-bit register accesses each port. The register addresses are given in the table above and the bit maps below.

PORT A DATA

BASE ADDRESS + 0, 4

7	6	5	4	3	2	1	0
A7	A6	A5	A4	A3	A2	A1	A0

PORT B DATA

BASE ADDRESS + 1, 5

7	6	5	4	3	2	1	0
B7	B6	B5	B4	B3	B2	B1	B0

PORT C DATA

BASE ADDRESS + 2, 6

7	6	5	4	3	2	1	0
C7	C6	C5	C4	C3	C2	C1	C0

6.0 SPECIFICATIONS

Power consumption

+5V quiescent 750 mA typical, 980 mA maximum

Digital Output

Digital Type 74S244

Configuration 6 banks of 8 bits each, output only

Number of channels 48 outputs

Output High 2.4 volts min @ -15mA

Output Low 0.5 volts max @ 64 mA

Power up / reset state Logic low

Environmental

Operating temperature range 0 to 70°C

Storage temperature range -40 to 100°C

Humidity 0 to 90% non-condensing

For your notes.

For your notes.

EC Declaration of Conformity

We, Measurement Computing Corporation, declare under sole responsibility that the product:

<u>Part Number</u>	<u>Description</u>
PC104-DO48H	Digital output board

to which this declaration relates, meets the essential requirements, is in conformity with, and CE marking has been applied according to the relevant EC Directives listed below using the relevant section of the following EC standards and other normative documents:

EU EMC Directive 89/336/EEC: Essential requirements relating to electromagnetic compatibility.

EU 55022 Class B: Limits and methods of measurements of radio interference characteristics of information technology equipment.

EN 50082-1: EC generic immunity requirements.

IEC 801-2: Electrostatic discharge requirements for industrial process measurement and control equipment.

IEC 801-3: Radiated electromagnetic field requirements for industrial process measurements and control equipment.

IEC 801-4: Electrically fast transients for industrial process measurement and control equipment.

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