

LabMaster[®] DPCI

- with Ribbon Cable Connections -

User's Guide



Solving Problems for Problem Solvers[™]

LabMaster[®] DPCI

- *with Ribbon Cable Connections* -

User's Guide



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Agency Approvals

FCC-B FCC NOTICE-WARNING

This equipment generates and uses radio frequency energy and if not installed and used in accordance with the instructions, may cause interference to radio or television reception. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect equipment into an outlet on a circuit different from the receiver.
- Consult the dealer or an experienced radio/TV technician for help
- Shielded cables must be used in order to comply with the emission limits.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

CE-Mark Declaration of Conformity

This product meets the essential health and safety requirements and is in conformity with the relevant EC directives herein listed using the relevant section of the following EC standards or normative documents:

Application of Council Directives:

89/336/EEC, 92/31/EEC and 93/68/EEC Article 5

Standards for which conformity is declared:

EN55022, EN50082-1 (IEC 801-2, 801-3, 801-4)

Manufacturer: Scientific Solutions Inc., - USA

Type of Equipment: LM DPCI board for computer

The CE marking has been affixed on the device according to Article 5 and 13 of the council directive 93/68/EEC.



Checklist

The Scientific Solutions Lab Master DMA/PCI consists of the following items:

- Lab Master DPCI Interface for inside the PC
- Lab Master DPCI external DeskTop enclosure
- Cable to connect internal PC interface to DeskTop enclosure
- Lab Master DPCI Handbook
- Lab Master DPCI Software Driver Diskette

Your carton/ product may also contain the following options if purchased with the Lab Master DPCI.

- LabPac Software Package
- Screw Terminal Blocks

The Scientific Solutions' Lab Master was the world's first data acquisition card available for the IBM PC. In fact the original Lab Master also has the distinction of being the worlds first add-in card of any type for the PC. It was first introduced in 1981 and remains today the longest selling PC add-on card.

This version of the LabMaster DMA is made for the PCI bus. It combines the power of the PCI bus with the features, stability and compatibility of the LabMaster DMA for the ISA. The design goal of the LabMaster DPCI was to be 100% compatible with the original LabMaster product first introduced in 1981. This is to help our many customers continue to use their applications without having to re-create software. Because of the differences between the ISA and the PCI architecture, software applications that directly write to the ISA DMA controller will not work in PCI systems. We note this because some LabMaster software uses this ISA feature, while other software does not.

This handbook contains configuration information for the Lab Master DPCI - including, information about the product, how to configure the many different features and options, description of jumper/switch settings and signal connectors, and how to install the PC Interface.



Introduction

Lab Master DPCI - Product Description

Four of the most requested data acquisition and process control functions are provided by the Lab Master DPCI including Analog-to-Digital Conversion, Digital-to-Analog Conversion, Digital I/O, and Timer/Counter functions. The features of the Scientific Solutions Lab Master DPCI are contained on two boards. One board installs directly into a single slot in the PC. The other board is external to the PC and connects to the internal board with a cable. The board in the computer - the PC interface - interfaces to the high-speed PCI bus and also controls the external board functions. The external board contains all of the Analog-to-Digital and Digital-to-Analog conversion - keeping the analog signals outside of the typically noisy PC environment. This external ADC design first introduced by Scientific Solutions in the original 1981 LabMaster, provides access to remote analog sources while insulating the sensitive analog electronics from possible electrical interference generated by the PC. This arrangement permits ultra-low noise measurements.

The LabMaster DPCI is a very versatile data acquisition product and as such there are many different options available. It is available in several models that vary according to A/D resolution, speed, and programmable amplifier gain settings.

Many options are available for the LabMaster DPCI including screw termination modules for convenient connecting of discrete wires, the DeskTop BNC unit for a handy desktop BNC arrangement, and specialty desktop units with a variety of available connectors. Contact Scientific Solutions regarding more information on any of these options or any special configurations you may need.

The version you have has ribbon cable connections that provide the same connector and pin out as the LabMaster DMA. This allows you to use the same cables to connect to the LabMaster DPCI DeskTop unit that you have been using with the LabMaster DMA / ISA product.



Features

Interface and Compatibility Features:

- High-speed PCI interface for today's faster computers
- Software compatible with the original 1981 "ISA" LabMaster
- Easy cable from the PC Interface to the external DeskTop enclosure

Analog Input Features:

- 16 Analog Input Channels with fast settling front end signal conditioning
- External Analog-to-Digital circuitry for ultra-low noise measurements
- Accurate timed A/D conversions with auto-increment
- Programmable Gain Amplifier to handle different input signal levels

Analog Output Features:

- 2 Analog Output Channels with five selectable output ranges
- External Digital-to-Analog circuitry for clean noise-free signal generation

Digital I/O Features:

- 24 bits of digital I/O
- Full support for 8255 modes 0, 1 and 2 including full I/O handshaking
- Dynamic Digital Buffering (DDB™) in all operation modes

Timer/Counter Features:

- Five high-speed 16-bit on-board Timer/Counters for precise timing
- Timer can be used for precise A/D conversions
- Timer can be used to generate computer interrupts for application timing



Configuring the LabMaster DMA/PCI

Lab Master DPCI - Product Configuration

Before installing the Lab Master DPCI verify that the options for its functions are set correctly for the desired application. The information contained in this manual assists in checking the different features.

Unpack the Lab Master DPCI. The product consists of a small board that is installed inside the computer, and an external DeskTop unit. All of the options are configured by opening the DeskTop unit and selecting various jumpers and switches. If you are familiar with the setup of the LabMaster DMA ISA product, then you will see that the DPCI version has much the same settings and options. There are no user configurable jumpers or switches on the PCI interface.

The LabMaster DPCI is configured from the factory as indicated in the table on page 13. If these settings are appropriate to your needs, then you do not have to modify any of the jumper or switch settings and you can proceed to the section in this manual regarding installation and cable connection which starts on page 22.

To modify any of the settings you need to open the DeskTop enclosure as detailed on the next page.

After you have configured the LabMaster, you can proceed to installing the PC interface described later in this manual.



Configuring the LabMaster DMA/PCI

Opening the LabMaster DPCI DeskTop Enclosure

The signal processing circuitry (Analog-to-Digital, Digital-to-Analog, Digital I/O, and Timer/Counter) is located in the LabMaster DPCI External DeskTop unit which is connected to the LabMaster PC Interface with a cable. All configurable options are located in the DeskTop unit. You may need to refer to your particular software documentation for any required settings.

The cover of the DeskTop enclosure must be removed to inspect the settings of the switch and jumpers that select the various options. Any cables or connectors to the various signals can also be installed when the cover is off.

Use the supplied flat-blade screw driver to remove the tabs in the four corners of the box top as shown. Remove the four screws now visible at the tab locations and lift the cover straight up. Note that your DeskTop unit may appear different from those in the pictures as there are several different models available.



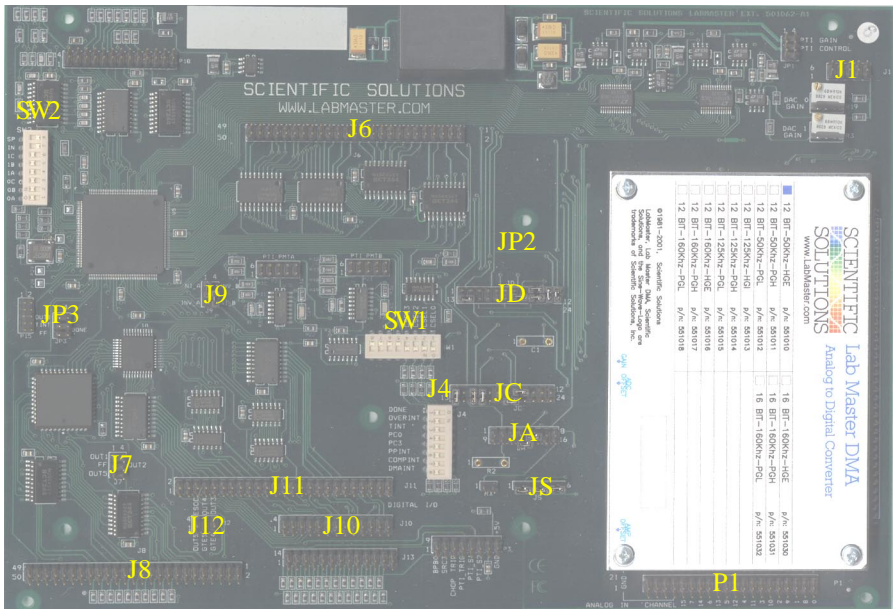
Normally, on the Lab Master DPCI External Board is a module that contains the analog to digital conversion (ADC) circuitry. Scientific Solutions manufactures a number of different ADC modules. The module should be identified with a label. ADC modules vary according to resolution, sample rate and analog input gain. Some modules have hardware gain, while others have software programmable gain. A/D resolution is typically 12-bit or 16-bit. Common sampling rates include 50 Khz or 160 Khz. Gain selections generally include HGE (hardware gain set by external components), PGL (gain = 1, 10, 100, 500) and PGH (gain = 1, 2, 4, 8). Note that some versions of the LabMaster DPCI DeskTop unit do not have a module installed and is for customers who are going to use an external module that is already installed in their equipment.

Diagrams on the following pages show the location on the Lab Master DPCI External Board of the various jumpers and connectors. Also shown are the default settings. Refer to these diagrams to verify or change the various configuration options to match the requirements or your particular software.

Configuring the LabMaster DPCI

Lab Master DPCI - External DeskTop Board Layout

The LabMaster DPCI DeskTop unit's internal circuit board contains the various configuration jumpers and switches. Additionally the board has the header connectors for connecting the various input/output signals to external devices. The diagram on this page shows the DeskTop's board layout. The location of the jumpers, switches, and connectors are indicated.



LabMaster DMA/PCI External Desktop Board Layout

Identify Pin 1 of Ribbon Cables

Normally ribbon cables are connected to the signal connectors. Ribbon cables generally have a colored stripe down one edge indicating the location of pin 1. When connecting ribbon cables, always be sure the colored stripe on the cable corresponds with pin 1 of the connectors the cable is attaching to. This manual uses a red color to identify pin one on connector drawings.



Configuring the LabMaster DPCI

Lab Master DPCI - Signal Connectors

The Lab Master DPCI DeskTop unit has five connectors to connect signals to external devices. The External Desktop Board Layout indicates the location of these connectors. The specific pin out are described on the following pages.

J1	Analog Output - DAC (10 pin connector)
P1	Analog Input - ADC (40 pin connector)
J6	External Module Interface (50 pin connector)
J8	Timer/Counter I/O (50 pin connector)
J10	Digital I/O (26 pin connector)
J11	Digital I/O (50 pin connector)

- The diagrams in this manual use a Red Pin to indicate Pin #1 Position

Lab Master DPCI - Default Configuration

The Lab Master DPCI DeskTop uses several jumpers and switches to configure the numerous features. The External DeskTop Board Layout indicates the location of these jumper/switches. The specific configuration settings are described on the following pages. The following table indicates the function as well as the default setting.

FUNCTION	SWITCH/JUMPER	DEFAULT
Base Address Resource Selection	PCI plug-and-play	710h (1808d) with SSI driver
Interrupt Resource Selection	PCI plug-and-play	Set by computer BIOS
Interrupt Source Selection	Switch J4	None Selected
Timer Interrupt Source (TINT)	Jumper JP3	None Selected
Timer Interrupt Latch Source	Jumper J7	None Selected
Timer/Counter Connections	Jumper J12	None Selected
Count A/D Conversions (DONE)	Jumper JP3	Disabled
Digital I/O Handshaking	Jumper J9	Non-Inverting
Analog Out (DAC) Range	Switch SW2	-10v to +10v
Analog Input Mode Differential or Single-Ended	Jumper JS	Single-Ended
Analog Input Mode Unipolar or Bipolar	Jumper JA	Bipolar
Analog Input Mode Normal or Overlap	Jumper JC	Normal
Analog Input Last Channel	Switch SW1	Channel 15
Analog Input Data Format Binary or Two's Complement	Jumper JD	Two's Complement
Internal / External Module	Jumper JP2	IN = Internal Module Present OUT = No Internal Module

Configuring the LabMaster DPCI

Base Address Selection

The LabMaster DMA ISA product used switches to select the particular computer address that the LabMaster product used. The LabMaster DPCI card uses the PCI plug-and-play standard to automatically assign computer resources. The LabMaster DPCI internal PC card installation (described later in this manual) discusses computer Base Address selection.

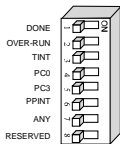
Interrupt Sources - Switch J4

The LabMaster DMA ISA product used Jumper J4 to perform two tasks:

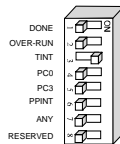
- (1). Select a particular interrupt resource (IRQ) of the computer
- (2). Select a particular interrupt source from the LabMaster card

The LabMaster DPCI card uses the PCI plug-and-play standard to automatically assign computer resources. The LabMaster DPCI internal PC card installation (described later in this manual) discusses computer Interrupt (IRQ) selection.

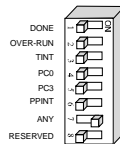
The LabMaster DPCI uses switch labeled J4 to select the particular interrupt source from the LabMaster that will be used to generate an interrupt. The default setting is for no interrupt sources selected. A particular interrupt resource is selected by turning on the corresponding switch location as demonstrated in the following examples:



No Interrupt Sources
(DEFAULT)



Timer Interrupt
(Example)



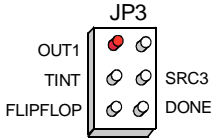
Any Interrupt
(Example)

Configuring the LabMaster DPCI

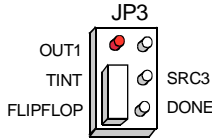
Timer/Counter Timer Interrupt (TINT) Source - Jumper JP3

Jumper JP3 performs two independent functions:

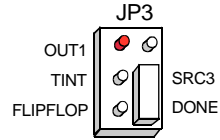
- (1). Selects the TINT interrupt source as either OUT1 or FlipFlop
- (2). Permits connection of the DONE signal to Source-3



No TINT Source
No SRC3 to DONE
(DEFAULT)



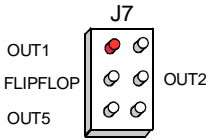
FlipFlop as TINT
source
(Example)



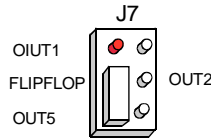
SRC3 to Done
(Example)

Timer/Counter FlipFlop Selection - Jumper J7

Jumper J7 selects the particular counter OUT signal for the FlipFlop signal that is used by JP3. Choices are OUT1, OUT2 or OUT5 as demonstrated in the following example:



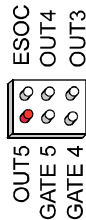
No Selection
(DEFAULT)



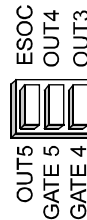
OUT5 Selected
(Example)

Timer/Counter Configurations- Jumper J12

Jumper J12 permits easy connection of Timer/Counter signals which some software may require.



No Selection
(DEFAULT)

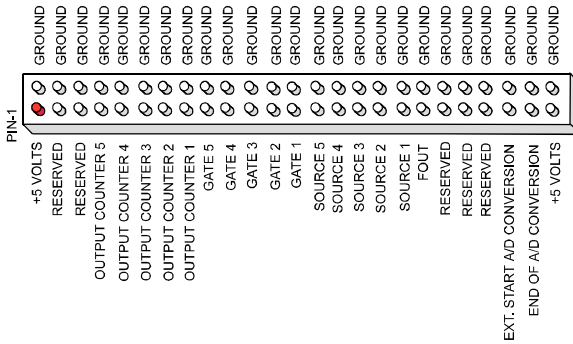


All Connected
(Example)

Configuring the LabMaster DPCI

Counter/Timer Signals - Header Connector J8

The Timer/Counter signals of the LabMaster can be interfaced to external devices thru connector J8, which is a 50pin header connector with 0.1" spacing between the pins.

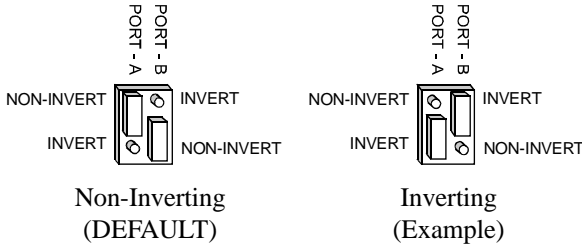


J8

Configuring the LabMaster DPCI

Digital I/O Handshaking - Jumper J9

Jumper J9 selects either INVERTING or NON-INVERTING handshaking for the Digital I/O. Normally non-inverting is used unless your particular software requires inverting.

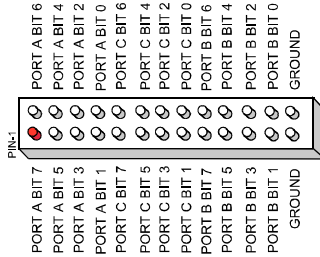


Note about Digital I/O Buffering

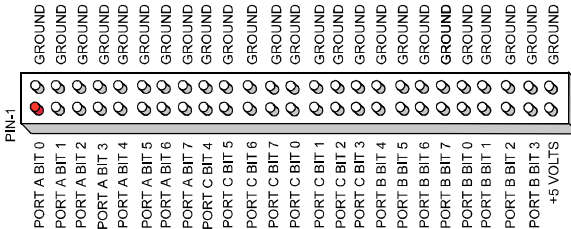
The ISA version of the LabMaster DMA has six Universal Socket Sites (USS) so that input or output buffering can be installed between the on-board Digital I/O circuitry and an external device. The LabMaster DPCI has Digital I/O buffering, but now it is all done automatically using Dynamic Digital Buffering.

Digital I/O Signals - Header Connector J10 and J11

The Digital I/O signals of the LabMaster can be interfaced to external devices thru connector J10 or J11, which are 26 pin and 50pin header connectors (respectively) with 0.1" spacing between the pins.



J10



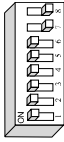
J11



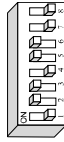
Configuring the LabMaster DPCI

Analog Output Range Select - Switch SW2

Switch SW2 is used to select the Analog Output (DAC) range as follows:



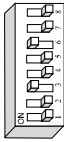
-10v to +10v
(DEFAULT)



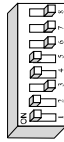
-5v to +5v



-2.5v to +2.5v



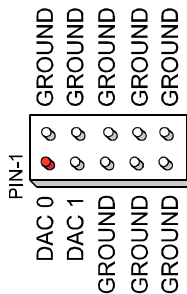
0v to +10v



0v to +5v

Analog Output Signals - Header Connector J1

The Analog Out signals of the LabMaster can be interfaced to external devices thru connector J1, which is a 10 pin header connector with 0.1" spacing between the pins.



J1

Configuring the LabMaster DPCI

ADC Module

Most users of the LabMaster DPCI will have an A/D module inside the DeskTop unit. Like the LabMaster DMA / ISA product, the LabMaster DPCI has many different features and options that are set using various jumper and switch settings. The following pages detail the various possible configurations.

If there is an A/D module installed in the DeskTop unit, then the 40 pin P1 connector will be used to connect your Analog Input signals.

Some installations will not have an A/D module installed in the DeskTop unit, but will instead use an external LabMaster ADC. An example would be an installation that has the External LabMaster ADC (AD-221) installed in a piece of equipment.

If there is not an A/D module installed in the DeskTop unit, then the 50 pin J6 connector will be used to connect the External LabMaster ADC to the DeskTop unit.

Module Internal / External - JP2 Jumper

Jumper JP2 needs to be installed if the DPCI DeskTop unit contains an A/D module. If the DeskTop unit is connected to an external module (thru the J6 connector), then JP2 should not have a jumper installed.



JP2 - Module Installed in DeskTop Unit

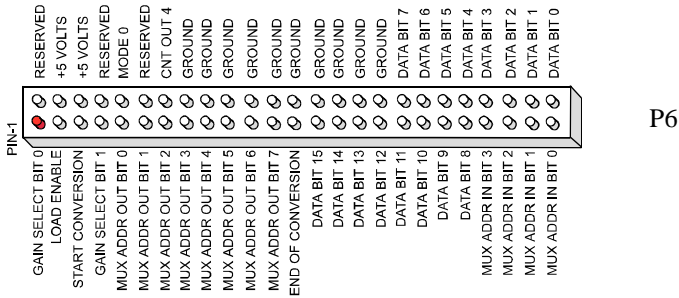


JP2 - Module NOT in DeskTop Unit

Configuring the LabMaster DPCI

External Module Signals - Header Connector J6

An External LabMaster ADC (AD-221) can be interfaced to the LabMaster DPCI DeskTop Unit thru connector J6, which is a 50 pin header connector with 0.1" spacing between the pins.

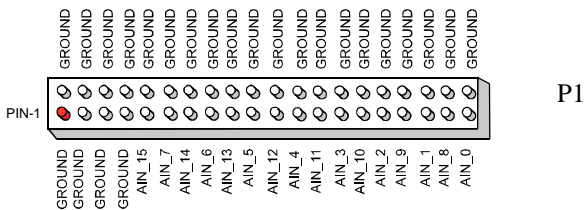


Note: If using J6 Then

- A module must NOT be installed in the DeskTop unit
- JP2 Jumper must NOT be installed
- JD Jumper must have NO jumpers
- Analog Inputs will connect to the External LabMaster ADC

Analog Input Signals - Header Connector P1

The Analog Input can be interfaced from external devices to the LabMaster thru connector P1, which is a 40 pin header connector with 0.1" spacing between the pins.



Note: If using P1 Then


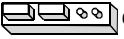
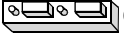
- A module MUST to be installed in the DeskTop unit
- JP2 Jumper MUST be installed
- JD Jumper MUST be configured for Binary or Two's Complement
- Analog Inputs will connect to P1



Configuring the LabMaster DPCI

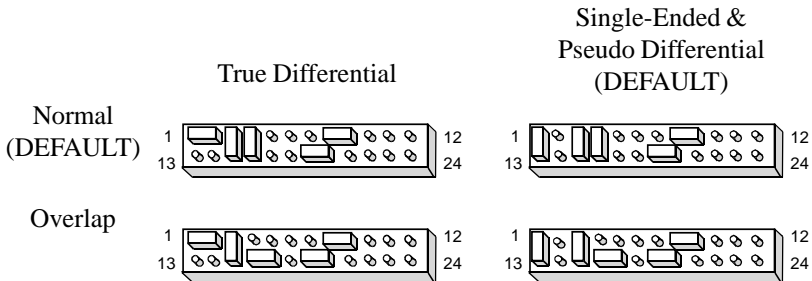
Analog Input Mode, Differential or Single-Ended - JS Jumper

Jumper JS Selects the analog inputs to be either Differential or Single-Ended for the internal A/D module.

- 1  6 Single-Ended (DEFAULT)
- 1  6 Pseudo-Differential
- 1  6 True Differential

Analog Input Mode, Normal or Overlap - Jumper JC

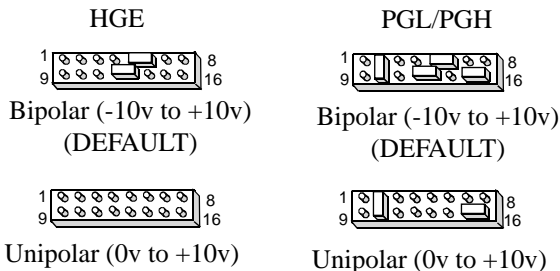
Jumper JC Selects the mode of operation for the A/D conversion of the internal A/D module. Normal mode cycles the three processes of channel selection, sample and hold settling, and A/D conversion in sequential order. Overlap mode dovetails the sample/hold and conversion process, i.e. the next channel is settling while the current channel is being digitized. Normal mode operating with Single-Ended inputs is the most common and default mode.



Configuring the LabMaster DPCI

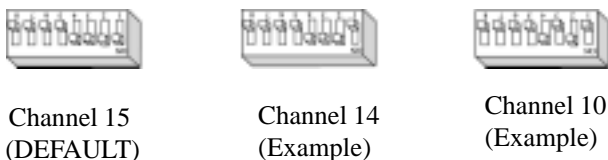
Analog Input Range, Bipolar or Unipolar - Jumper JA

Jumper JA Selects the analog input range of the internal A/D module as either Unipolar (0v to +10v) or Bipolar (-10v to +10v). The HGE and the PGL/PGH have different settings, so be sure the settings match the particular A/D module you have.



Analog Input Last Channel - Switch SW1

SW1 selects the last channel that is used with the internal A/D module when A/D conversions use auto-increment mode. When sweeping thru channels and the channel selected by SW1 is reached, the next channel is channel 0 and the sweeping continues.

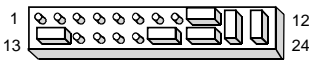


Configuring the LabMaster DPCI

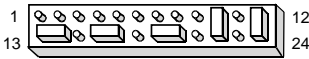
ADC Data Format, Binary or Two's Complement - Jumper JD

Jumper JD selects the A/D data format for data from the internal A/D module. There are two sets of settings depending upon if you have a 12-bit module or a 16-bit module. Two's complement is normally used with bipolar inputs, whereas binary is normally used with unipolar analog inputs.

12-bit Modules



Two's Complement (DEFAULT)

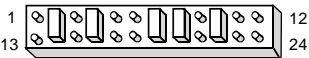


Binary

16-bit Modules



Two's Complement (DEFAULT)



Binary

Jumper JD Note:

If the DPCI DeskTop unit DOES NOT have an internal module, but is instead using an external module connected to J6, then ALL of the jumpers on JD need to be removed.

Installation Instructions

Installing LabMaster DPCI Hardware

(1). Installing the card and connecting to the DeskTop Unit

You can install the LabMaster DPCI interface into any free slot in your computer. Then you can connect the LabMaster DPCI interface to the external DeskTop unit with the included cable.

(2). Signal Cable Connections on the DeskTop Unit

The back of the DeskTop unit contains the various connectors that you will use to attach your signal cables.



Note: Your DeskTop unit with either have J6 (50 pin) or P1 (40 pin) as the upper left connector when viewing the DeskTop unit from the back.

J6 - External ADC, 50 pin header for connection to a LabMaster External ADC board. This is for installations that have the ADC circuitry installed in another piece of equipment remote from the DeskTop unit.

P1 - Analog Input, 40 pin header for connection of your Analog Input signals

J1 - Analog Output, 10 pin header that provides the Analog Output signals

2.1mm Power Input Jack for the power supply

J8 - Timer / Counter, 50 pin header

J10 - Digital I/O, 10 pin header

J11 - Digital I/O, 50 pin header

DB25 LabMaster Connector for connection to the LabMaster DPCI card

Installation Instructions

Installing LabMaster DPCI Hardware

(3). Connecting your Signal Cables

Attach your ribbon cable connections to the appropriate header connector on the back of the DeskTop unit. Pay attention to the location of PIN-1 and be sure to attach your cables properly.

(4). Connect the power supply to the DeskTop Unit

Attach the power supply provided with the product to the DeskTop unit. With the power supply attached and plugged in, a blue light will illuminate on the front of the DeskTop unit indicating that the DeskTop unit has power.

(5). Power up the Computer

With all the cables attached (Power supply, LabMaster Connection, Signal cables) you can then power up your computer. When the computer is turned on, a red light will illuminate on the front of the DeskTop unit.

Note that under normal operating conditions, both the blue (power supply “on”) and the red (computer “on”) lights on the front of the DeskTop unit will illuminate. When neither is on, either the power supply is not plugged into your AC electrical outlet and/or the power supply is not plugged into the back of the DeskTop unit. When the computer is turned “off”, the blue light will still stay illuminated. With just the blue light, the unit is consuming very little power and most of the internal circuitry is off.

CAUTION: If you ever have the need to open the DeskTop unit, be sure that the power cable and the LabMaster Cable are NOT connected.



Installation Instructions

Installing LabMaster DPCI Software

Normally, interrupt levels (IRQ) used by a PCI card are automatically assigned by the computer. If you need to assign a particular interrupt (like IRQ-5) to the PCI interface, then you will have to access your computer's BIOS setup. This is typically accessed by pressing the DEL key upon power-up. The setup menus should include a screen for configuring PCI and PNP devices. Some computer systems have the ability to assign a particular interrupt to a PCI slot. If your computer has this ability then you should be able to select the slot where you installed the PCI interface and set its interrupt level - sometimes also called interrupt priority. PCI slots are normally numbered starting with '1' (the first slot) closest to the power supply. If your computer does not provide you with the ability to manually set the PCI interrupt for a particular slot, then you will have to configure your software to use the interrupt automatically assigned by the computer - or use another computer.

(2). DOS Software Notes:

If you are using the LabMaster DPCI to replace a LabMaster ISA card, and you want to use your existing software without modification then you will need to run the PCICFG program from the included diskette. You should put this program in the AUTOEXEC.BAT file.

Normally a PCI card is automatically "assigned" an address by the computer. The PCICFG program allows you to "specify" a particular address. This allows you to configure the LabMaster DPCI to the address required by your DOS software. The PCICFG.TXT file in the DOS directory of the diskette has complete information on the usage of the PCICFG.EXE program. Example:

```
PCICFG 5353 4321 1 710
```

- (a). It sets the Base Address of the LabMaster to 0710h (1808d)
- (b). It responds back with the interrupt level (IRQ) assigned to the card.
If your software uses interrupts, you should make sure that the interrupt level assigned to the card is used by the software.
- (c). It indicates if the DeskTop unit can be found.



Installation Instructions

Installing LabMaster DPCI Software

(3). Windows Software Notes:

The included diskette contains the Windows Device Drivers. The INSTALL.TXT file on the diskette contains specific information about installing drivers for a particular version of windows.

Windows 98, 2000, XP:

When you start Windows 98, 2000 or XP, it should automatically find the hardware and prompt for the device driver which is located on the diskette.

Windows NT 4.0

WinNT 4.0 installation is different from the other versions of windows since NT does not support plug-and-play. WinNT 4.0 uses a unique driver. Refer to the NT4.TXT file in the NT4-W95 directory of the diskette for installation notes.

Windows 95

Win95 also uses a unique driver. Refer to the W95.TXT file in the NT4-W95 directory of the diskette for Win95 installation notes.

DOS Session of Win95, Win98:

If you are going to run DOS software under a DOS session of Win95 or 98, you should use the Windows Device Manager to change the address of the card to match your software requirements and do not use PCICFG.EXE

Note: Win NT, 2000 and XP do not have the capability of running DOS software, i.e. they do not have a true DOS compatibility session. So although you can change the address of the PCI card, the operating system will not allow DOS software to access the hardware. This is a limitation of the operating system and not of the hardware.

Scientific Solutions windows driver is a true 32-bit kernel mode driver. The Application Programming Interface (API) for the windows driver is Scientific Solutions LabPac32.DLL (Dynamic Link Library). The LabPac32.DLL is a function library that is installed with the driver. The functions are callable from languages such as C/C++, VisualC, VisualBasic and other programming languages. Programming documentation for LabPac32 is available at www.Scientific-Solutions.com.



Technical Specifications

Computer Interface

Bus:	PCI
Slots:	One slot in PC
Address:	PCI Plug-and-Play configured
Interrupts:	PCI Plug-and-Play configured
Power	900mA@+5V Typ
Load:	1TTL load/bus line max

Amplifier Characteristics

Voltage Input Max: Power Off (no damage) Power On (no damage) Proper Operation	+10V +/-25V +/-10V
Input Impedance:	>100 M Ω
Source Impedance:	<10 K Ω
Diff-Amp CMRR (Gain 1-10): Diff-Amp CMRR (Gain 500):	80 dB (DC to 1Khz) 100 dB (DC to 1Khz)

ADC Characteristics

Resolution:	Module Dependent - 12 bit or 16 bit
Maximum Throughput:	Module Dependent - 50Khz or 160Khz
Inherent Quantizing Error:	+/- 1/2 LSB
Linearity:	+/- 1/2 LSB
Differential Linearity:	+/- 1/2 LSB
Monotonicity:	Guaranteed 0°C to 70°C

System Stability and Signal Dynamics

Tempco of Linearity:	+/- 3ppm/°C FSR
Tempco of Diff. Linearity:	+/-3ppm/°C FSR
Tempco of Gain:	+/-30ppm/°C FSR
Tempco of Offset: Bipolar Unipolar	20mV/C° 10mV/C°
Power Supply Sensitivity:	0.003% FSR / % Change Supply Voltage
Tempco of Linearity:	3ppm/°C
Accuracy: Gain = 1 Gain = 100 Gain = 1,000	+/-0.03% Full Scale Range (FSR) +/-0.05% Full Scale Range (FSR) +/-0.10% Full Scale Range (FSR)
S/H Aperature Uncertainty:	10 nsec
S/H Feedthrough:	-80 dB at 1Khz

Service Information

Your product should provide you with trouble free performance. However, if you have any questions about the installation or operation, or you encounter any problems, the following information will be helpful.

Scientific Solutions - Technical Support (Requires Product Registration)

Phone:	(440) 357-1400
Fax:	(440) 357-1416
E-mail:	support@LabMaster.com
Internet:	http://www.LabMaster.com

Should your product require factory service, the following guidelines must be followed and will help you get the fastest service.

1. Save your sales receipt. The product you purchased is covered under the limited warranty from the date of purchase, but you must submit proof of purchase for in-warranty repair.
2. Contact Scientific Solutions. You must obtain a Return Material Authorization (RMA) number prior to sending the unit to Scientific Solutions. This number must be displayed on the packing box.
3. Return all the components with your RMA. Complete troubleshooting is impossible if all components are not included. For protection against damage in transit, repack the system in its original packing.
4. Damaged and abused products will be repaired out of warranty only. Unauthorized attempts to repair, dropping, submitting to electrical surges, etc. will void the warranty.
5. Ship the unit to Scientific Solutions freight prepaid. After in-warranty service, the unit will be returned freight prepaid by a carrier designated by Scientific Solutions. Use of any other method will be freight collect or imposed shipping charge. Out-of-warranty service, will be returned freight collect or imposed shipping charge.
6. Cosmetic damage will not be repaired in warranty.

Note: Policies may change without notice.



Limited Warranty

Definitions:

Scientific Solutions means Scientific Solutions Inc., USA (www.LabMaster.com)

Warranty:

With respect to the product(s) delivered with this Limited Warranty, Scientific Solutions warrants to the original purchaser that:

- i) The product manufactured by Scientific Solutions will be free from defects in materials and workmanship for two (2) years from the date of delivery to such original purchaser
- ii) Any software/firmware is provided "as is" without warranty of any kind by Scientific Solutions
- iii) Any items not originally supplied by Scientific Solutions are without warranty of any kind. Use of components and accessories that do not conform to product specifications may void the warranty.

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If Scientific Solutions determines that any product which has been returned to Scientific Solutions in accordance with the provisions of the preceding paragraph is not under warranty, it will be repaired using Scientific Solutions' standard rates for parts and labor. Scientific Solutions will use its best efforts to repair the product after receipt thereof. Scientific Solutions shall not be responsible, however, for delays caused by shipping or non-availability of replacement components or other similar or dissimilar causes, events or conditions beyond its reasonable control.

THE FOREGOING STATES THE PURCHASER'S EXCLUSIVE REMEDY FOR ANY BREACH OF THIS LIMITED WARRANTY AND FOR ANY CLAIM, WHETHER SOUNDING IN CONTRACT, TORT OR NEGLIGENCE, FOR LOSS OR INJURY CAUSED BY THE SALE OF ANY PRODUCT. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, SCIENTIFIC SOLUTIONS SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS OF BUSINESS OR PROFITS, DOWNTIME OR DELAY, LABOR, REPAIR, OR MATERIAL COSTS, INJURY TO PERSON OR PROPERTY OR ANY SIMILAR OR DISSIMILAR CONSEQUENTIAL LOSS OR DAMAGE INCURRED BY PURCHASER, EVEN IF SCIENTIFIC SOLUTIONS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSSES OR DAMAGES. SCIENTIFIC SOLUTIONS SOLE AND EXCLUSIVE MAXIMUM LIABILITY TO THE PURCHASERS SHALL BE LIMITED TO THE PURCHASE PRICE OF THE PRODUCT.

Keep your original sales receipt for the product with this warranty statement.

Support: Scientific Solutions will provide support to the dealer or end user for this product. This support expires 30 days after shipment of this package from Scientific Solutions. Additional support and updates may be purchased from Scientific Solutions.

General: This license is governed by the State of Ohio. This license constitutes the entire agreement between you and Scientific Solutions. It cannot be ratified except in writing signed by an officer of Scientific Solutions.

Product Registration Required for Repair or Support.



