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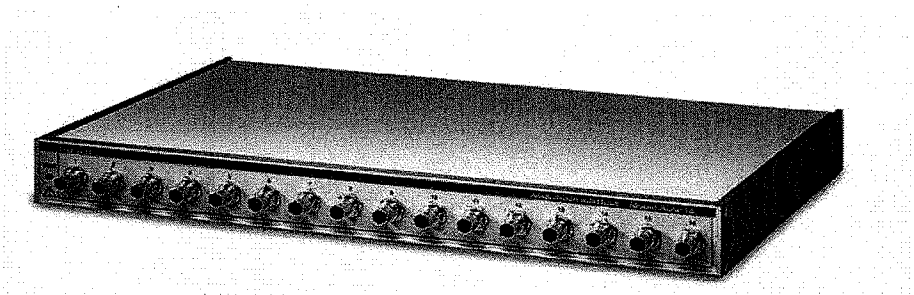
Find the *Data Sciences International / LDS / Gould ACQ-16* at our website: ***Click HERE***

Life Science Suite™

ACQ-16 / Type 2 Installation Manual

Manual Part Number
M02908

By Gould, LDS Test and Measurement LLC



Gould, LDS Test and Measurement LLC
8333 Rockside Road, Valley View, Ohio 44125-6100
http://www.gouldmedical.com

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SAFETY SUMMARY

This general safety information is for both user and service personnel. Specific **WARNINGS** and **CAUTIONS** will be found throughout the manual where applicable.

TERMS IN THIS MANUAL AND ON THE INSTRUMENT

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property if instructions are not followed. They appear in boldfaced capital letters.

WARNING statements identify conditions or practices that could result in personal injury or loss of life if instructions are not followed. They appear in boldfaced capital letters.

SYMBOLS IN THIS MANUAL AND ON THE EQUIPMENT



This symbol indicates paragraphs providing cautionary and detailed information about a specific part of the instrument. That part of the equipment is also marked with this symbol. (See references to this symbol in the manual.)



WARNING, risk of electric shock



AC, Alternating current



DC, Direct Current



Type B Equipment with an F-Type applied part



Type B Equipment



Type CF Equipment



PROTECTIVE CONDUCTOR TERMINAL; Earth (ground) (reference IEC publication 417-5019)



Earth (ground) TERMINAL (reference IEC publication 417-5017)



Equipotentiality (reference IEC publication 417-5021)

Chassis (ground)



Fuse



OFF (Power connection from Main)

ON (Power connection to Main)



STANDBY (Power is on, instrument off in standby mode)

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WARNING

IF THIS GOULD INSTRUMENT IS OPERATED OR USED IN A MANNER NOT SPECIFIED BY GOULD, LDS TEST AND MEASUREMENT LLC, THE PROTECTION PROVIDED BY THE SYSTEM MAY BE IMPAIRED.

POWER SOURCE

This instrument is intended to operate from a power source that does not apply more than 250 volts RMS between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential.

GROUNDING THE INSTRUMENT

This instrument is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) may render an electric shock.

USE THE PROPER POWER CORD

Use only the power cord and connector specified for your instrument. Use only a power cord that is in good condition.

TEST LEADS AND INTERCONNECT CABLES

Test leads and/or interconnect cables may carry **HAZARDOUS** live voltages. They must be examined regularly for mechanical and electrical wear and tear. If any wear or break has occurred, the lead or cable should be replaced.

USE THE PROPER FUSE

To avoid fire hazard, use only a fuse of the correct type, voltage rating and current rating as specified in the parts list for your instrument.

DO NOT OPERATE WITHOUT COVERS AND PANELS INSTALLED

To avoid personal injury and equipment damage, the user should disconnect power before removing covers, panels or any grounding straps. Reinstall covers, panels, and any grounding straps *before* reconnecting power.

WARNINGS FOR AUTHORIZED SERVICE PERSONNEL

Dangerous voltages exist at several points in this instrument. To avoid personal injury, do not touch exposed connections or components while power is on. Disconnect power before removing protective panels, soldering, or replacing components.

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System Overview

ACQ-16 Acquisition Interface Unit

The ACQ-16 Acquisition Interface Unit is one of the available acquisition interfaces for the GOULD Life Science Suite (LSS). An acquisition interface unit interfaces high-level analog signals into the LSS system.

The LSS is designed for the user whose application demands flexibility along with accurate, continuous, non-interrupted data monitoring, recording and analysis in a standardized environment. The LSS combines specialized hardware and software, transforming your personal computer into a medical research workstation. This unique, comprehensive data recording tool can be used to provide you with continuous data storage and an analysis of the results of your experiments either as they occur, or during a subsequent review. The LSS is a 32-bit application designed for the Microsoft Windows™ 98, Windows NT 4.0 or Windows 2000 operating system environment, delivering very efficient use of the computer.

The ACQ-16 accepts any conditioned high level (approximately 1 Volt to 10 Volts full scale) input, allowing the system to be easily configured for special application requirements. The ACQ-16 is the interface between instrumentation signal conditioner modules and the system computer. The acquisition interface accepts the input from an expansive array of analog signals and converts the signal for use by the system computer. Any quality analog signal conditioning system, such as the Gould 4600 or 6600 family of modules, may be utilized.

The ACQ-16 includes an embedded analog-to-digital conversion board that communicates and transfers data over a parallel link with your PC. All that is needed on the PC is a bi-directional, EPP (Enhanced Parallel Port) port, or ECP (Enhanced Centronics Port) port that can emulate EPP. No additional hardware on the host PC is required.

System Configuration

The ACQ-16 is a sixteen-channel acquisition interface unit utilized by the Life Science Suite. It has sixteen BNC input connectors for interconnection to instrumentation signal conditioning.

For detailed information on the Life Science Suite or Analysis software modules, please refer to their specific Reference Manuals

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System Requirements

The minimum requirements for the Life Science Suite are:

1. A personal computer configured as follows:
   A. PONEMAH Physiology Platform software, P3 Plus Acquisition and Analysis operation disks
   B. Pentium 500 MHz processor or better
   C. Windows 98/NT/2000
   D. Minimum of 128 MB of RAM
   E. Hard disk capable of holding system software and experiment data (500 MB recommended minimum)
   F. AGP/PCI video graphics board capable of at least SVGA (800x600); for best performance it is strongly recommended that a video graphics card capable of 1024x768 resolution be used.
   G. One open PCI slot
2. PCI EPP Interface Card – part number P01926
3. Your choice of instrumentation signal conditioning modules and analysis modules

For information on Gould products and services, check out our website at www.gouldmedical.com.

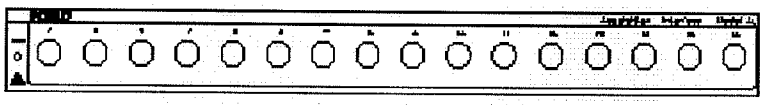
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Configuring the System

System Description

The Gould Acquisition Interface Model ACQ-16 permits continuous data acquisition at up to an aggregate 100,000 samples per second with a bi-directional, EPP or ECP/EPP emulation parallel port.

The Acquisition interface accepts up to sixteen inputs from standard instrumentation signal conditioning modules. The outputs from these modules are connected to the individual BNC input connectors on the acquisition interface front panel.



Picture Of Front Panel

The internal AC power supply operates between 100 - 240 VAC; 50/60 Hz. The AC input rating is auto switching.

Initial Inspection

Prior to attempting any electrical connections or operation, visually examine the unit for any damage.

Parts List

The following items comprise the system:

1. Acquisition Interface Unit Model ACQ-16
2. PNM-P3P-xxxx software on CDROM
3. Floppy disk with license file
4. P01989 software key for parallel port
5. P01255 – Parallel port IEEE 1284 interface cable
6. P01926 – PCI EPP interface card (if not delivered as a full system with a computer.)

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7. J02936 BNC Cable set labeled 1-8
8. J02937 BNC Cable set labeled 9-16
9. Any other order options

EPP Interface Card Installation

If the system was delivered with a configured computer or if the on board computer LPT port is going to be used, this step can be skipped. It is highly recommended that this port be used as the interface to the ACQ-16 unit.

1. Make sure that the personal computer is unplugged.

Windows 98 Only

2. Before inserting the card, make sure that there is no other device at the LPT2 address of 278HEX (contact your internal computer support group for system configuration information).
3. Remove the cover from the personal computer to expose the expansion slots.
4. Verify that the EPP Interface card is configured as EPP for LPT2. Refer to the documentation supplied with the EPP card to change the configuration settings.
5. Install the card into an open PCI slot.
6. Reinstall the personal computer cover.
7. Plug in the computer, and boot the computer.

Windows NT and Windows 2000 only

8. Follow the device driver installation procedure provided by the manufacturer.

Software Installation

If you did not purchase a complete system with everything installed and tested, you will need to install the P3 Plus system software. For the Acquisition Interface to operate correctly, you must install the software onto the hard disk of the personal computer. The procedures are outlined in the Ponemah Physiology Platform reference manual.

For the ACQ-16 Acquisition Interface Unit to operate, the user must select ACQ-16 as the acquisition device in the **Acquisition Select** dialog.

Installing the ACQ-16 Acquisition Interface

1. Connect an IEEE 1284-1994 parallel cable between the Acquisition Interface and the parallel printer port card that was installed in your PC.
2. Turn on power to the Acquisition Interface unit, and start the P3 Plus-xxxx software. **NOTE:** the Acquisition Interface must be connected and powered prior to starting the software.
3. Connect the Acquisition Interface BNC inputs to the analog outputs from your signal conditioning system.

⚠ ***Caution: Maximum input voltage is 30 VDC.***

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ACQ-16 Connections

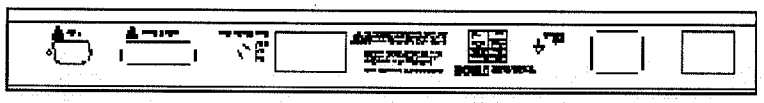


Figure 1: Rear Panel

The Acquisition Interface has two input/output connectors and the power connection on the rear panel (refer to Figure 1), the Input Parallel Port connector and the Auxiliary connector.

A voltage range switch is also present on the rear panel of the unit, which allows the selection of the input signal voltage.

Parallel Port Connector

This bi-directional "parallel port" connector is a 25 pin "D" subminiature male connector. See table 1 for an illustration of the connector and pin designations. A standard 25 pin male D-shell to 25 pin female D-shell parallel port cable (Gould part No. P01255) is connected between the Parallel Port connector on the acquisition unit and the parallel (printer) port on your computer. The parallel port cable must be connected before the Acquisition Interface and PC are turned on.

Input Voltage Range

This rotary switch sets the full-scale input range of the analog-to-digital converter.

The range selected here must be matched in the software under the **Calibration** drop down menu, **A/D Input Range** dialog box.

Auxiliary Connector

This is a 9 pin female "D" subminiature connector. See table 3-2 for an illustration of the connector and pin designations. It allows output of an event (TTL) signal defined by the software protocol (see Figure 1). This feature is not currently supported by the P3 Plus software.

Signal Input

Signal input is accomplished via the sixteen BNC connectors on the front panel of the Acquisition Interface (see Figure 2). The input circuit is a buffered fixed span of +/- 2.5, 5 or 10 Volts full scale. These ranges are selectable by a three position rotary switch on the rear of the module (see Figure 1). The three ranges allow you to set up the ACQ-16 for full-scale compatibility with most common signal conditioning systems.

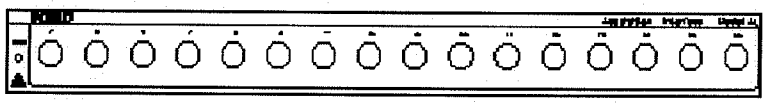


Figure 2: Front Panel

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Getting Started

Introduction

Before turning on the Acquisition Interface power, be sure the line voltage is within the power supply specifications.

The power switch for the Acquisition Interface is located on the rear of the unit. A green light located on the front panel illuminates when power is ON.

The only operating control for the Acquisition Interface is the rotary selector switch on the rear of the module. This switch allows you to set the module to be electrically compatible with the output signal from your signal conditioning modules. Consult your operation manuals for your signal conditioning system to confirm the output specifications.

Connect the Acquisition Interface to the LPT port selected during installation using a standard parallel cable (Gould part No. P01255). If you have not already installed the P3 Plus-xxxx software on your system, please refer to the **PONEMAH Physiology Platform** reference manual for installation instructions.

Connect your input signals (refer to Figure 1).

Once the inputs are connected, power up the Acquisition Interface, and start the P3 Plus application. You are now ready to begin recording data.

Starting the P3 Plus Program

The GOULD Life Science Suite is designed to be extremely simple to use. After the software has been installed, start the system by double clicking on the **P3 Plus** icon on the desktop.

If the software has been installed correctly, the system will display a dialog that the application needs a license file.

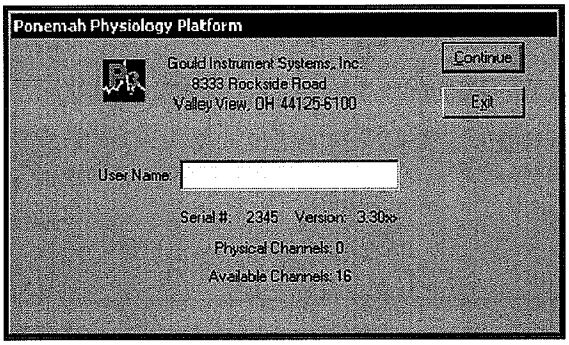


License File message

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After selecting the <OK> button, the user will be prompted to enter a license file. Insert the supplied license floppy disk, and select the license file from the floppy.

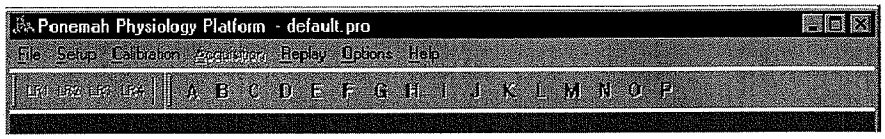
After the license has been loaded, the P3 Plus user name dialog will appear as displayed below.



User Name dialog

The User Name that is entered will be recalled automatically the next time the system has been started. The name entered here will be used on all printouts and audit logs for identification of the data collected.

After entering <Continue>, the Main Menu screen is displayed as below. You are now ready to begin setting up, acquiring and analyzing your input data.



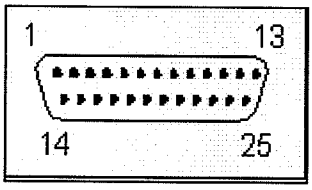
The P3 Plus software includes a "default" test setup to help you get started. If a problem occurred during the installation, the system will report the error. See the Troubleshooting appendix at the end of your P3 Plus software manual for more information.

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System Description

Digital Data Connections

The ACQ-16 Acquisition Interface is connected to your personal computer via its 25-pin Parallel Port connector labeled **Parallel Port**. This parallel port digital bus connection includes all communication and data transfer with the PC.

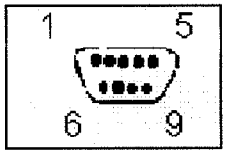


Pin Number	Function	Pin Number	Function
1	Strobe	14	Auto
2	Data Bit 0	15	Error
3	Data Bit 1	16	Init
4	Data Bit 2	17	SLCT
5	Data Bit 3	18	Ground
6	Data Bit 4	19	Ground
7	Data Bit 5	20	Ground
8	Data Bit 6	21	Ground
9	Data Bit 7	22	Ground
10	ACK	23	Ground
11	BUSY	24	Ground
12	PE	25	Ground
13	SLCT		

Table 1

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Auxiliary Connector



Pin Number	Function	Pin Number	Function
1	Alarm	6	Reserved
2	Reserved	7	Reserved
3	Reserved	8	Trigger In
4	Reserved	9	Not Used
5	Ground		

Table 2

Interconnect Cable Connections

The Acquisition Interface is connected to a host computer by a 25 pin parallel cable (IEEE 1284-1994 compliant).

If you require assistance in configuring your system, contact our customer support department at (216) 328-7000. You can also request assistance from our support department by contacting us through our web site at www.gouldmedical.com or by email at support@gouldis.com.

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Appendix

Specifications

Electrical	
Line Voltage	Auto-switching 100-240VAC (±10%)
Line Frequency	50/60 Hz
Analog Inputs	
Number Channels	16
Maximum Input Voltage	30V Peak
Acquisition System	
Maximum Aggregate Sample Rate	100K Samples/Second
Resolution	12 bits ±1LSB
Filter	1 pole, fixed @ 50KHz, ±20%
A/D Noise	<±0.25% Full Scale
A/D Offset	<±0.25% Full Scale
A/D Gain Error	<±0.25% Full Scale
Bandwidth	Flat to –1% @ 5KHz, -3dB @ 50KHz
Auxiliary Output	
Outputs	6 TTL level I/O lines
Environmental	
Temperature: Storage	-25 to 85° C
Temperature: Operation	0 to 50° C
Humidity	10% to 90% Relative Humidity 18°C
Physical	
Dimensions: height	1.83 inches with feet
Dimensions: height	1.72 inches without feet
Dimensions: width	16.73 inches
Dimensions: depth	10 inches
Dimensions: depth to connectors	10.62 inches
Weight	5 pounds

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Troubleshooting

If the system displays the following message on startup, **EPP1 A/D Board Not Found**, then verify the following:

1. The Acquisition Interface is powered up, and the 1284 parallel port cable is connected to the personal computer.
2. The correct parallel port is being used (LPT1/LPT2/LPT3). Reinstall the software, and select the correct LPT port.
3. Parallel port should be EPP compatible. If the Acquisition Interface is connected to the standard parallel port, verify that the port is EPP compatible. This is done by changing the settings in the computer BIOS. If the computer does not support EPP mode, change the PPP3.INI setting to use bi-directional transfer mode.
4. Windows NT and Windows 2000 device driver needs to be functional. Refer to the manufacturer's instructions for installing the device driver.

INI File Setting

The PPP3.INI file will have a **[Comm]** section, which is used to set up the communications with the ACQ-16 unit.

This section specifies to the application which parallel port, transfer mode, interrupt usage and port transfer width to use.

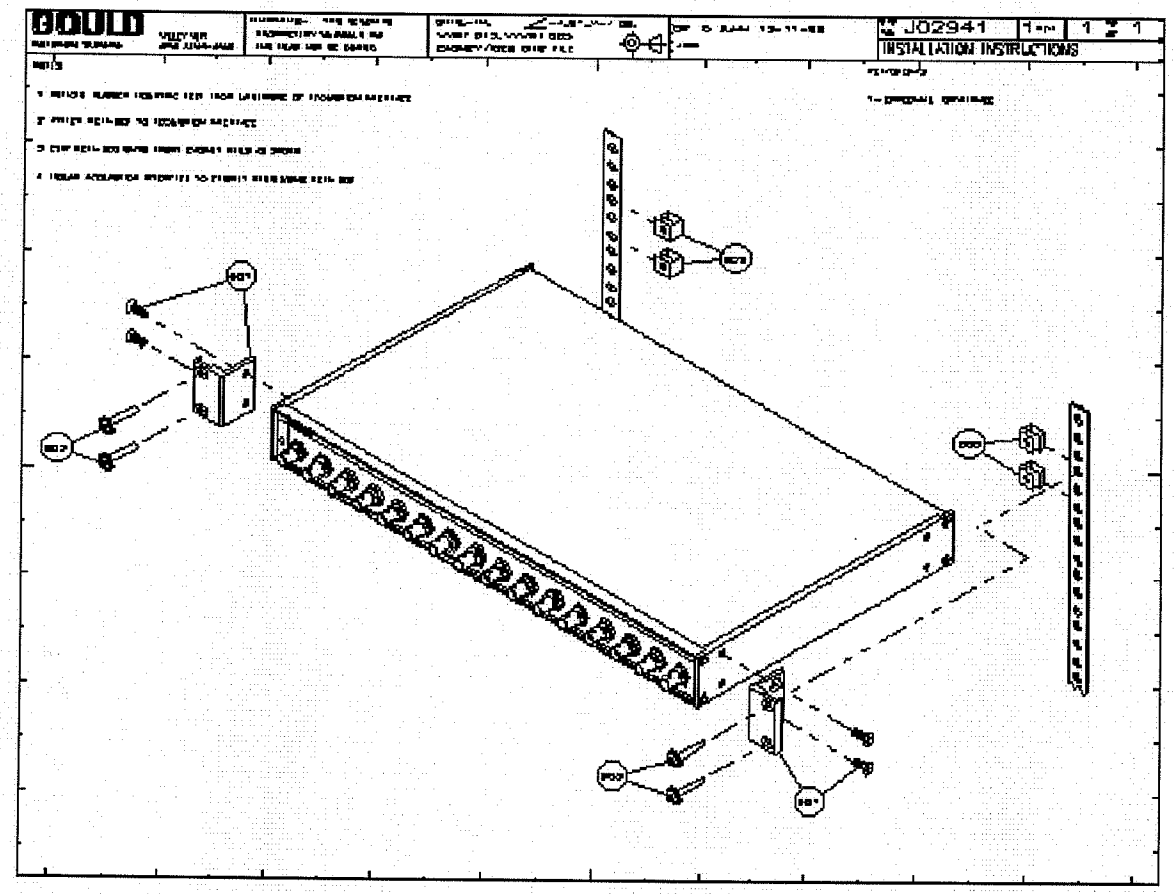
The table below lists the different configurations (defaults marked with an *):

Subsection	Value	Meaning
Port	0*	Use LPT1
	1	Use LPT2
	2	Use LPT3
Mode	0*	Auto-detect transfer mode
	1	Use bi-directional transfers
	2	Use EPP transfers
EPPPortWidth	0*	Auto-detect width
	1	Force 1 byte transfers
	2	Force 2 byte transfers
	4	Force 4 byte transfers
EPPUseIrq	0*	No IRQ usage
	1	Use IRQ and only valid for NT

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Rack Mounting

The diagram below displays how to assemble the rack mount kit.



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A

A/D Input Range 5
Auxiliary 5

C

CDROM 3

E

ECP/EPP 3
EPP 1, 3, 4

I

i-directional 5
IEEE 1284 3
IEEE 1284-1994 10
Input Parallel Port 5

L

LPT2 4

P

Parallel Port 9

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