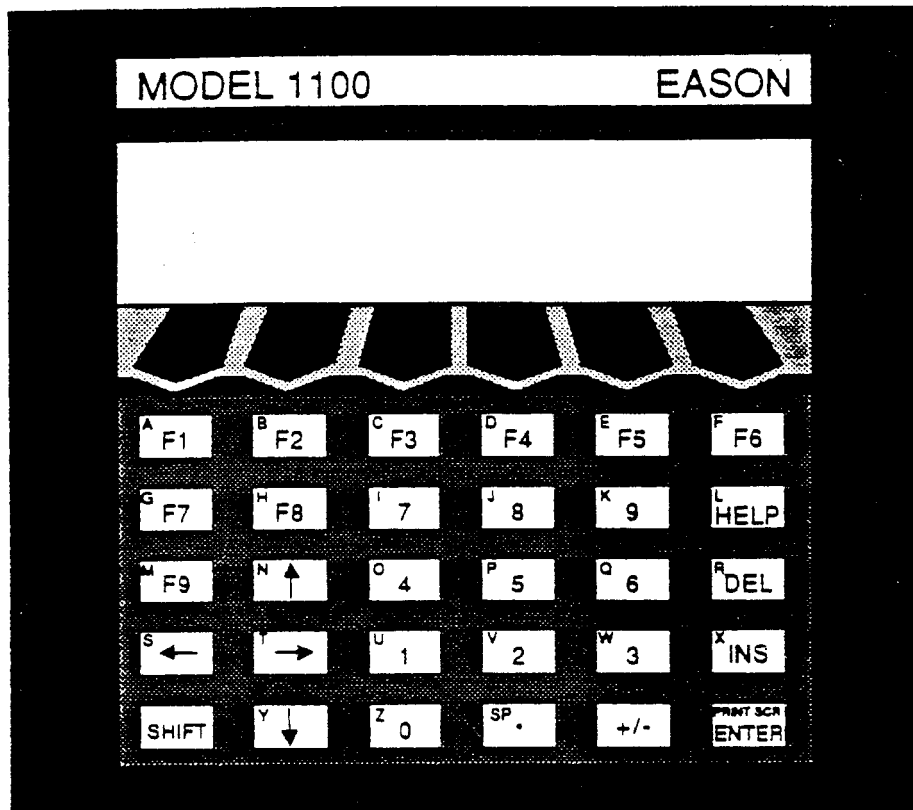


Model 1100

Intelligent Operator Interface



EASON
TECHNOLOGY

Preface

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Revision 3.2 p/n 50-00004-01

Eason Technology, Inc.

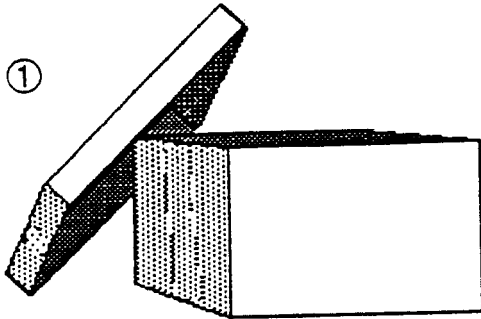
241 B Center Street Healdsburg, CA 95448

Phone: (707) 433-2854 FAX: (707) 433-3706

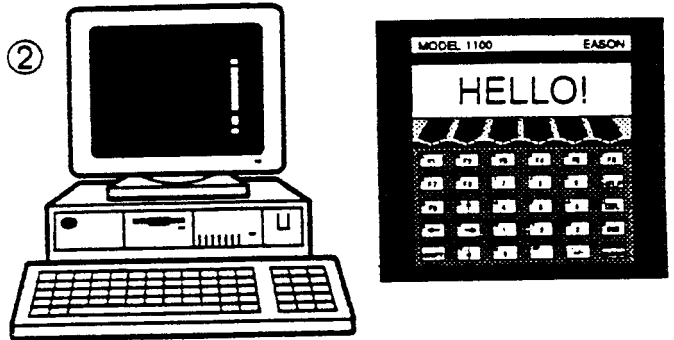


Getting Started Without Reading The Manual. . . *This Means You!*

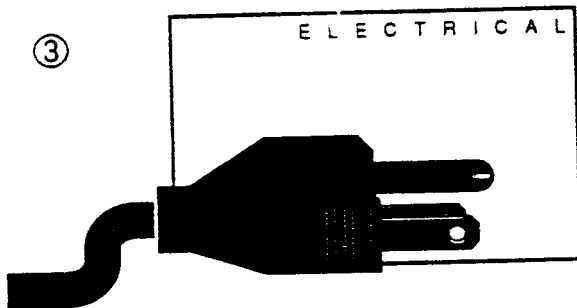
If you are not the first user of this Model 1100, the tutorial may not be loaded into it. If for some reason this program has been erased or overwritten, follow the instructions on the next page.



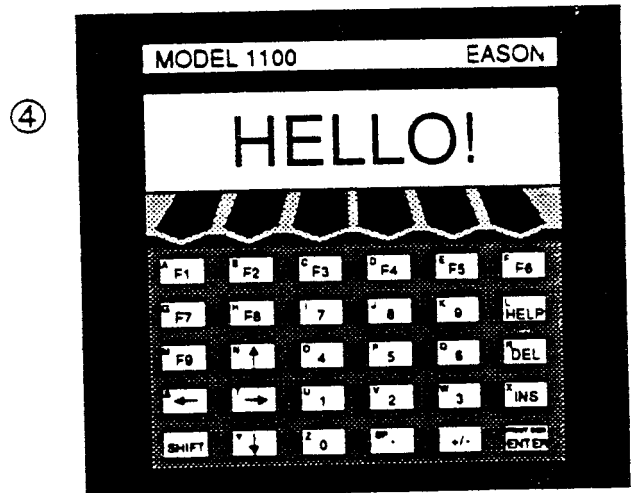
① Carefully unpack the Model 1100. Be sure to save the entire contents (including the box).



② Set the Model 1100 near an IBM PC-compatible computer.



③ Plug the Model 1100 into 110VAC.



④ Follow the instructions on the Model 1100's screen.

IF YOU ARE NOT THE FIRST USER OF THIS MODEL 1100

If you are not the first user of this Model 1100, the tutorial may not be loaded into it. If the tutorial is loaded into the Model 1100, the unit will greet you with a hearty "HELLO!" when the program starts. If for some reason this program has been erased or overwritten, complete the following instructions to get up and running.

- ① Plug the RS-232C NULL modem cable (supplied) between COM 2 on the Model 1100 and either COM 1 or COM 2 on your PC. Note which serial port on the PC that you are connected to (for information on the serial ports for your PC, refer to your PC's instruction manual).
- ② Copy the contents of your disk(s) onto your hard drive if you have one (copy both disks for 5 1/4" systems, only 1 disk for 3 1/2" systems). If you have a hard drive, log onto drive C: (i.e., type C: followed by Enter). Proceed to step ④.
- ③ If you do not have a hard drive, insert the ApplicationBuilder™ disk into your PC. If your PC has 5 1/4" drives, insert the 5 1/4" disk labeled DISK 1. If your PC has 3 1/2" drives, insert the 3 1/2" disk. Log on to the drive containing the ApplicationBuilder™ disk (i.e., type A: or B: followed by Enter).
- ④ Type **BUILD** followed by **Enter**. After a few seconds, a menu-bar and multiple windows will appear on your PC's screen.
- ⑤ Press **ALT-S**. A pull-down **SETTINGS** menu will appear at the top of your PC's screen (press **F1** on your PC's keyboard for help if you need it). Select the COM port on your PC that you have connected the NULL modem cable to in step ①. Perform the selection by moving the highlighted text bar in the window up or down using the **UP** or **DOWN** cursor keys. Press **Enter**. Press **Esc**.
- ⑥ Press **ALT-T**. The **TRANSFER** pull-down menu will appear. Select the **DOWNLOAD FILE** selection using the **UP** or **DOWN** cursor keys. A window will appear that contains a list of basic files to download.
- ⑦ Move the highlighted bar using the cursor keys and select the file **TUTOR.BAS**. Press **Enter**. The program will begin loading into the Model 1100. A counter on the PC's screen will show the number of characters transferred, the Model 1100's screen will display the BASIC program being downloaded.
- ⑧ Wait until the download is complete. The PC's screen will indicate when the download is complete. Press **F1 (RUN)** on the Model 1100. This will begin the execution of the tutorial you have just downloaded into the Model 1100.
- ⑨ Press **ALT-X**. This will exit the ApplicationBuilder™ and return to DOS. The Model 1100's screen will display a tutorial that will guide you through the use of the ApplicationBuilder™ program and the Model 1100.
- ⑩ Ignore instructions on connecting the Model 1100 to the PC, and selecting the COM port for your PC. You have already performed the necessary steps and they have been stored by the ApplicationBuilder™'s configuration file (this is automatically done).

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① Introduction

Features

- 8-line by 40-character back-lit LCD display with graphics
 - Powerful I/O capability
 - 2 serial ports (RS-232, RS-422, or RS-485)
 - 24 parallel I/O lines
 - IBM keyboard interface
 - IBM printer interface
 - All I/O is optically isolated
- Fully featured BASIC programming language
 - Interrupt capability
 - Floating point math
 - Formatted data entry
 - Graphics
 - Easy-to-use commands for on-board I/O
- Programmable, context sensitive help key
- NEMA 4 panel-mount housing
- Powerful PC-based ApplicationBuilder™ software included
 - Automatically builds BASIC programs
 - Place text on the Model 1100's screen in a wordprocessor-like manner
 - Build complex programs without in-depth knowledge of BASIC
 - Exchange programs between the PC and the Model 1100
 - Built-in terminal emulator
- Large full-travel, 30-key waterproof keypad
 - 9 soft keys
 - Tactile feedback

Features Description

The Model 1100 Smart Operator Interface allows you to quickly and easily set up and operate many types of industrial controllers. The Model 1100 provides overall control and a user interface for most types of controllers or computers that need an easy-to-use, intelligent operator interface. Stepping and servo motor controllers, PLC's, and process controllers are a perfect match for the Model 1100. With a Model 1100, an operator can view and change machine parameters, or follow instructions to perform operations. Users no longer have to fumble about with clumsy switches, thumbwheels, and indicator lights. Instead, a back-lit, 8-line by 40-character "super-twist" LCD display, and a large full-travel, 30-key waterproof keypad prompts and "listens" to the operator through machine operations.

Operators can be given as little or as much help required by programming the HELP key function with programmable help instructions. The Model 1100's LCD screen can display TEXT or GRAPHICS so block diagrams, flow charts, wiring diagrams, and statistical information can be displayed for the operator. For machine control, the Model 1100 provides 24 lines of parallel I/O, two serial ports (either RS-232C, RS-422, or RS-485), 8 timers, and

Integrated into all ApplicationBuilder™ functions is an UPLOAD/DOWNLOAD capability and a comprehensive, context sensitive HELP system

a printer port to facilitate machine monitoring and control functions. Optionally, up to 16 12-bit A/D, up to 4 12-bit D/A, up to 120 lines of I/O and up to 4 high-speed quadrature counters can be added. All I/O is optically isolated and designed to be extremely noise tolerant. Included with the Model 1100 is a disk containing the ApplicationBuilder™, a PC DOS program that allows you to quickly generate programs for the Model 1100. The ApplicationBuilder™ generates BASIC programs from simple menu selections and direct screen entry of text. It consists of three components:

- The *Builder* converts menu selections and direct screen text entry into BASIC code
- The *Editor* performs text editing of BASIC or other ASCII files
- The *Terminal Emulator* performs like a "dumb" terminal to talk to the Model 1100.

Functional Description

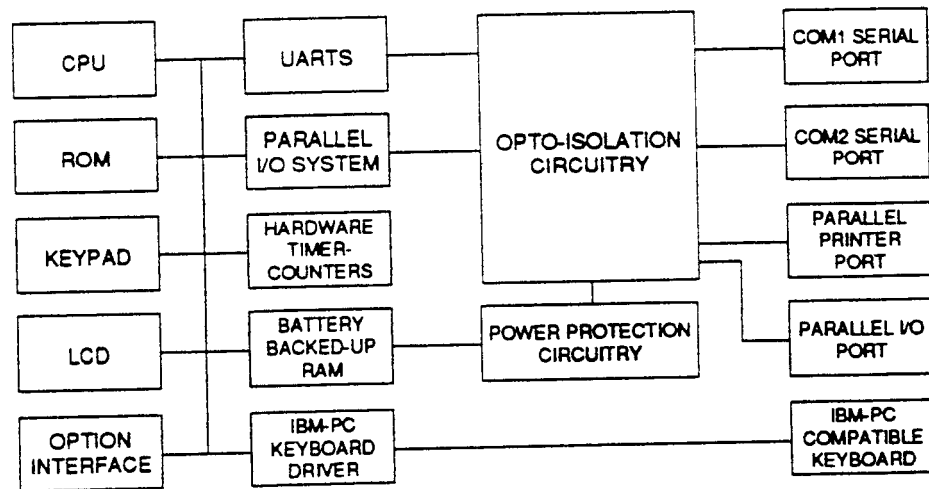
The Model 1100 is housed in a rugged cast housing that is meant to be flush-mounted in an equipment panel. A full gasket and a rigid mounting system form a water tight seal about the opening. The display is sealed and the keypad is constructed of a water tight silicone rubber. The keypad on the front of the Model 1100 is organized into three color coded groups.

- WHITE - NUMERIC ENTRY
- BLUE - ACTION- CURSOR, ENTER, INSERT, DELETE, HELP
- YELLOW - FUNCTION KEYS

The 8-line by 40-character LCD display serves as a display port, programming tool, and soft key label. In *Edit Mode*, the display can be used to scroll through text, make changes, or debug programs. In *Run Mode* text, soft key titles, and graphics can be displayed under program control.

The rear of the Model 1100 incorporates the entire connector system for parallel, serial, and printer I/O. Half of the rear panel is reserved for options. The figure below diagrams the internal components of the Model 1100. The heart of the unit is a high speed 64180, 8-bit high integration CPU chip. The CPU communicates with UARTS (serial ports), ROM, RAM, TIMERS, I/O, and the option connector. Battery backed-up RAM stores programs and variables even if power is removed. It can hold a program for more than 5 years without power applied. The opto-isolation circuitry is designed to provide a barrier between the outside world (I/O ports) and the CPU. This eliminates CPU errors in high noise environments. The serial ports, parallel I/O ports, and printer port have their own power supply to further insure that noise does not disrupt the CPU's operation.

Model 1100 Block Diagram



② Installation

This chapter focuses on the steps necessary to unpack and install the Model 1100. Read this section before attempting to apply the Model 1100. System installers should read this chapter before installing the unit into a cabinet, or connecting any electrical power to the Model 1100.

Unpacking and Inspection

Inspect the Model 1100's shipping container. Is there evidence of damage or mishandling? If damage exists contact your shipping carrier immediately. Eason Technology cannot be held responsible for damage in shipment. Compare the contents of the container with the packing list that is attached to the exterior of the shipping container. Your Model 1100 shipping container should include the following:

If any items are missing or damaged, contact Eason Technology immediately.

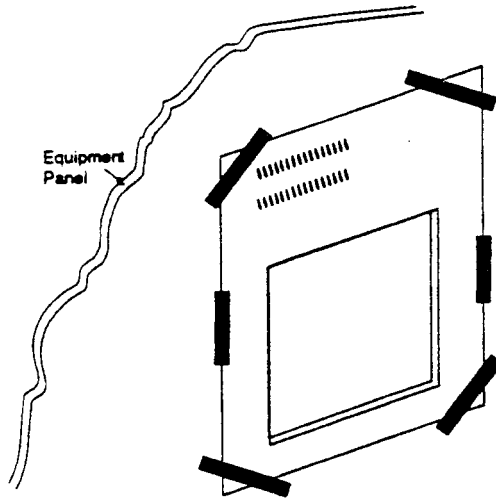
- ① Model 1100 with installed options
- ② Model 1100 User Guide
- ③ Eason BASIC Programming Guide
- ④ ApplicationBuilder diskettes
- ⑤ Power cable (attached to the Model 1100)
- ⑥ Null modem cable
- ⑦ Mounting clips (four)
- ⑧ Mounting template
- ⑨ Optional cables and connectors as indicated on the packing list.

Site Preparation

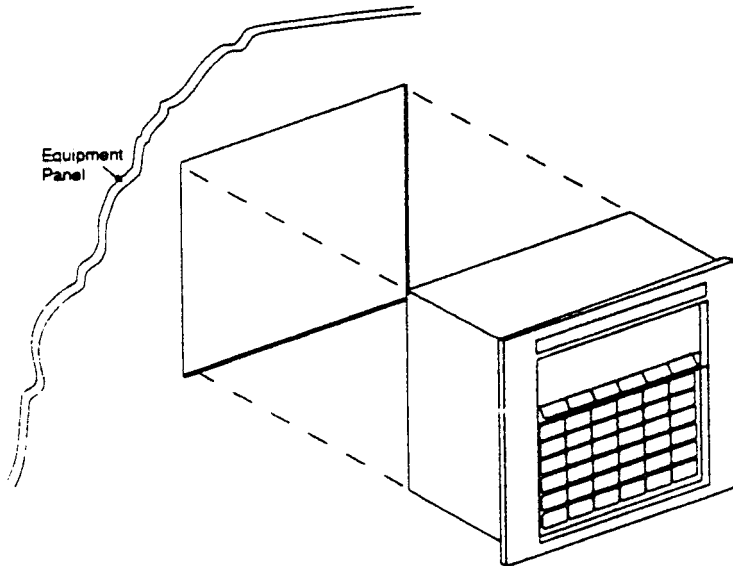
The Model 1100 is designed to be mounted in an equipment panel or other flat metal surface. If mounted properly, the Model 1100 will resist water, and seal the opening from water and dust. Improper installation could result in damage to the Model 1100 and other equipment installed in or adjacent to the panel containing the Model 1100. For safety reasons, follow the instructions below closely.

- ① Prepare the opening in the panel.
 - Tape the enclosed mounting template to the front of the panel in the desired location.
 - Drill 3/8 " inside the cutout to facilitate cutting.
 - Use a sabre saw or some other type of sheet metal cutting device to cut out along the "cut here" line.
 - Using a file, carefully remove any burrs or rough edges that may cut or scratch during the remainder of the installation.
 - Remove the paper template and discard.
- ② Carefully insert the Model 1100 into the hole in the panel from the front side.
- ③ Hold the Model 1100 to the panel, and insert the mounting pins as shown in the figure on the following page.
 - If the Model 1100 is to be used in continuously wet applications, apply a silicone sealer to the gasket prior to installation.
- ④ Tighten the mounting pins to secure the Model 1100 to the front panel.
- ⑤ Ensure that the Model 1100 fits snugly against the front panel, and that there are no gaps or holes that may allow water or dirt to enter the cabinet.

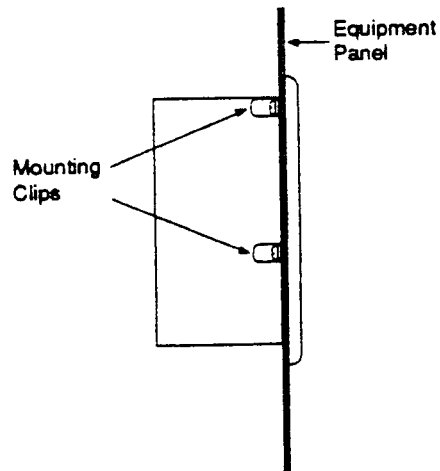
Panel Cut-Out



Mounting



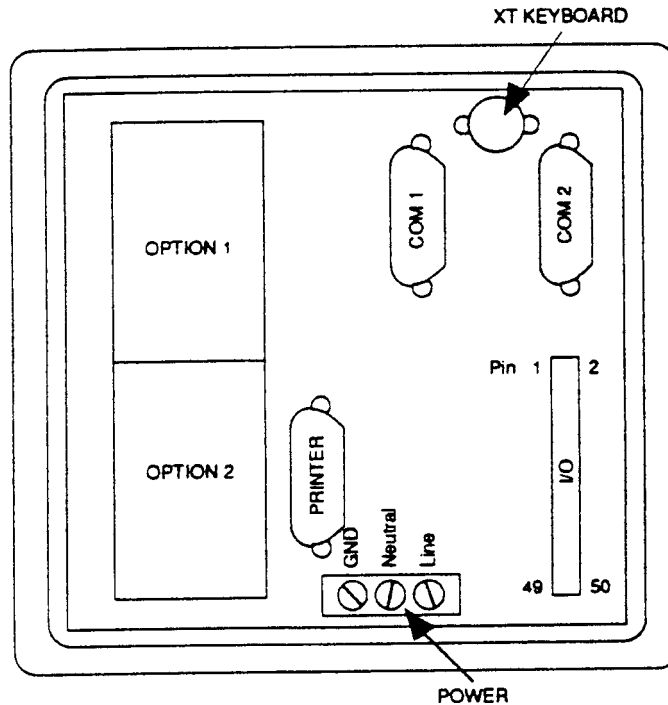
Mounting Pin Installation



System Interconnect

The Model 1100 is designed to meet a variety of applications. Therefore, it is impossible to describe a "standard" interconnect for the Model 1100. This section describes each individual connector on the Model 1100 and how to apply them.

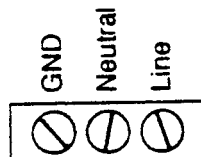
Model 1100 Rear Panel



• Power Connector

The Model 1100 is equipped with a three-prong USA power cable properly attached to the power connector. Should it become necessary to remove the Model 1100's power cable, or direct wire to the connector, follow the diagram below carefully.

Model 1100 Power Connector



WARNING !

MISWIRING THE MODEL 1100's POWER CONNECTOR MAY RESULT IN PERSONAL INJURY OR DEATH. PRODUCT DAMAGE OR FIRE MAY OCCUR.

• IBM PC-XT Keyboard Connector

Note that the IBM KEYBOARD connector is not optically isolated, and use in a high noise environment should be avoided.

An industry standard IBM PC-XT keyboard can be connected into the 5-pin DIN connector on the upper rear panel of the Model 1100. Some keyboards have switches that select XT or AT mode. Be sure that the switch is in XT mode. Some "auto-switch" type keyboards may not work with the Model 1100. If the keyboard you select is a universal keyboard, make sure it has a switch. The primary use for this connector and the IBM keyboard is program development. If necessary, remove the keyboard from the connector while running your application.

• COM1 and COM2 Connectors

COM1 and COM2 are the serial port connectors (DB-25 style, male). The pin-outs for these connectors are as follows:

All other pins not connected*

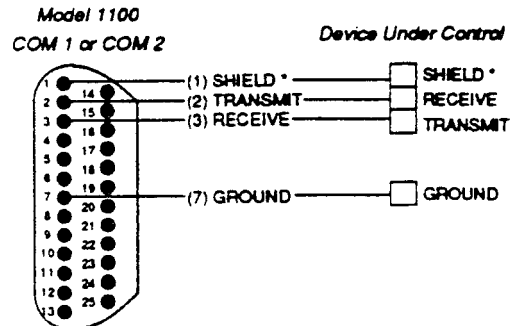
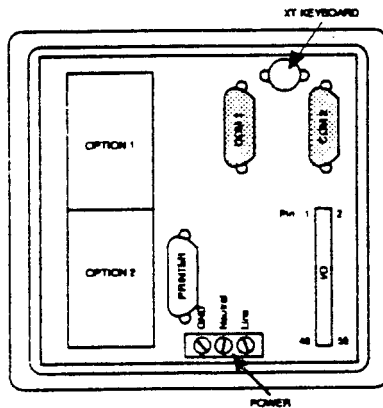
Pin	Connection
1	SHIELD
2	RS-232 TRANSMIT (OUTPUT)
3	RS-232 RECEIVE (INPUT)
7	SIGNAL GROUND
12	RS-422 TRANSMIT + (OUTPUT)
13	RS-422 TRANSMIT - (OUTPUT)
14	RS-422 RECEIVE + (INPUT)
15	RS-422 RECEIVE - (INPUT)

Important note to users of early Model 1100 versions

Some early versions of the Model 1100 (with serial numbers beginning with B or S) have connections to pins #4 and #5 (CTS and RTS). In current units, these pins are connected but inactive.

These connectors provide connection for serial communications between the Model 1100 and a variety of devices. Connections made with this connector are most commonly referred to as SERIAL PORTS. Examine your application carefully and make sure that you have TRANSMIT (Tx) on the Model 1100 connected to the RECEIVE (Rx) of the device under control, and RECEIVE of the Model 1100 connected to the TRANSMIT of the device under control.

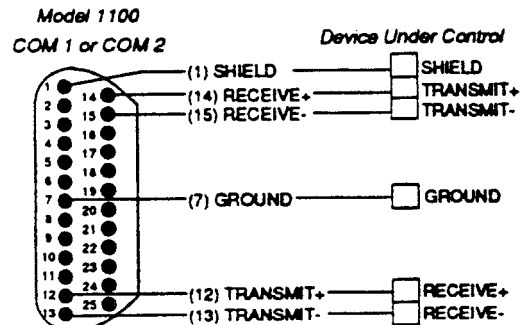
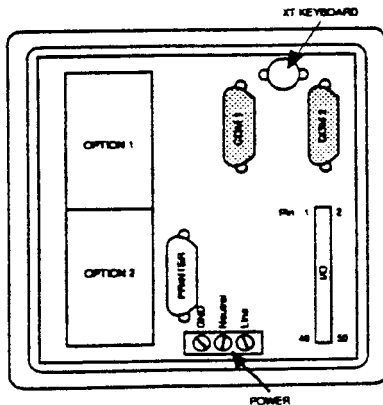
Minimum RS-232 Connections



* Recommended, but not necessary

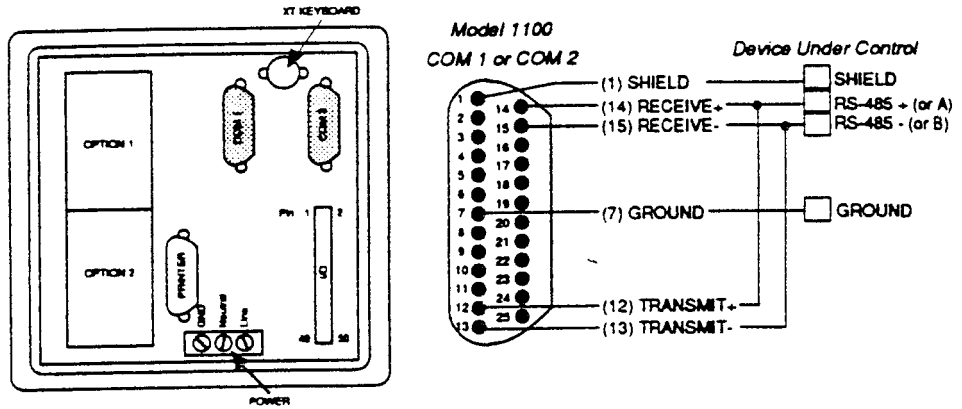
To use the RS-422 connections, follow the same conventions outlined above, connecting outputs on the Model 1100 to inputs on the device under control, and inputs on the Model 1100 to outputs on the device under control. To enable the RS-422 transmitters, refer to the RS-422 Statement in the *Eason BASIC Programming Guide*.

RS-422 Connections



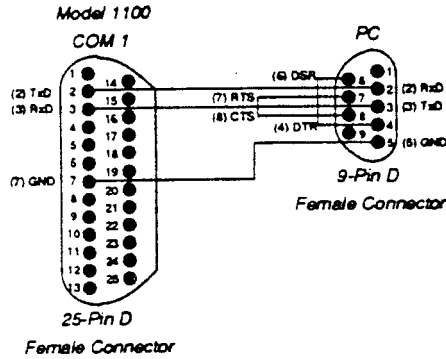
To perform RS-485 serial communications with the Model 1100, the RS-422 transmitter and receiver lines must be tied together. Since the RS-422 transmitters are disabled after power up, it is safe to assume that no line driver conflicts will occur. Refer to the RS-422 Statement in the *Eason BASIC Programming Guide*.

RS-485 Connections

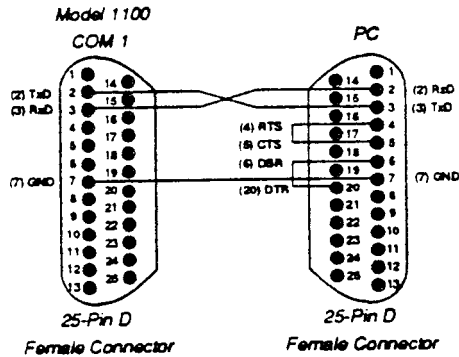


When programming the Model 1100 from a computer acting as a terminal emulator, a null modem cable must be used to connect RS-232C from the COM port on your PC to COM2 on the Model 1100. The Model 1100 is shipped with an appropriate null modem cable with DB-25 on one end for the Model 1100 and either a DB-25 or a DB-9 on the other end for the computer.

DB-9 to DB-25
Null Modem Cable



DB-25 to DB-25
Null Modem Cable



• I/O Connector

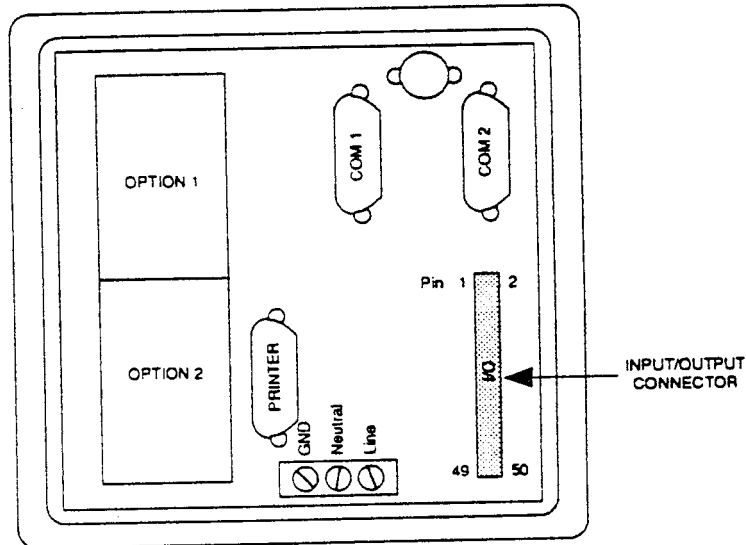
The I/O connector on the Model 1100 provides 24 bits of parallel I/O. Each line can be configured in software to perform input, output, or bidirectional operations. The pin-out is an industry standard 50-pin ribbon cable, compatible with PB-24 I/O boards.

I/O Connector Pin-out

(Even-numbered Pins: Logic Ground):

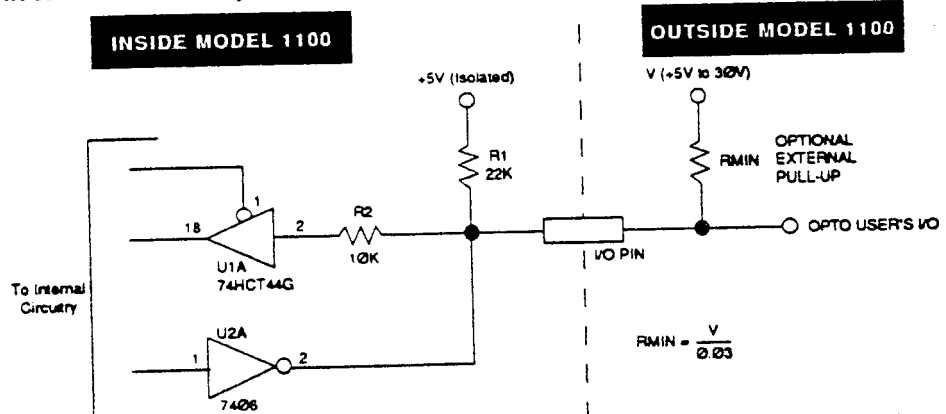
* (100 MA LOAD MAXIMUM)

Pin	Function	Pin	Function
49	+5VDC OUT *	23	I/O 12
47	I/O 0	21	I/O 13
46	I/O 1	19	I/O 14
43	I/O 2	17	I/O 15
41	I/O 3	15	I/O 16
39	I/O 4	13	I/O 17
37	I/O 5	11	I/O 18
35	I/O 6	9	I/O 19
33	I/O 7	7	I/O 20
31	I/O 8	5	I/O 21
29	I/O 9	3	I/O 22
27	I/O 10	1	I/O 23
25	I/O 11		



The schematic below represents one I/O bit on the 24-bit I/O interface. All 24 bits are identical.

One Channel of the 24-Bit I/O



U1 is a CMOS receiver that constantly monitors the status of the I/O line. Its input is current limited by R2 and pulled up by R1. A current limit (R2) is needed to allow the I/O pin to exceed the supply voltage of U1 without damage. The pull-up (R1) is a fairly high value (22K). Any voltage from 5 to 30VDC can be connected to the pin without damage to the pull-up resistor. U1 senses a logic high (1) on the I/O pin at 3.2V and a logic low (0) on the I/O pin at 1.4V regardless of the externally applied pull-up voltage.

