

PS-4 COMMUNICATIONS PORT SELECTOR

TECHNICAL REFERENCE

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SPECIFICATIONS

| | |
|------------------------------------|---|
| Size..... | 5" by 7" |
| Weight..... | 6 ounces |
| Computer Serial I/O Interface..... | RS-232 (optional RS-422/RS-485 available) |
| Number of Selectable Ports..... | (4) RS-422 ports (optional RS-485 available) |
| Selected Port Interface..... | Each of the (4) selectable ports comply with EIA standards for both RS-422 and RS-423 balanced/unbalanced voltage digital interface circuits. |
| Power Requirements..... | 9 to 14 volts DC 350ma (use PS-GP-1 power supply) |
| Options Available..... | RS-485 Serial Interface Standard for the four selectable ports |

DESCRIPTION

The PS-4 port selector connects one of (4) possible RS-422 communication ports to a computer RS-232 port using the RS-232 DTR and RTS control lines to select the desired RS-422 communications port. The PS-4 port selector may be multiplexed to create the appearance that all 4 ports are in use simultaneously (by continuously scanning all 4 ports). Each of the four selectable ports are converted from the RS-232 standard to the RS-422/RS-423 serial interface standard when selected.

TECHNICAL SUPPORT

Technical support for our products is available by calling (614) 464-4470. If a technical adviser is not available, please leave your name, phone number and a time that you can be reached. Your call will be returned as soon as possible.

WARRANTY AND CARE OF THE PS-4

The PS-4 Port Selector is warranted against factory defects for a period of 90 days from the date of purchase. The PS-4 has proven to be extremely reliable in actual operation during field tests. We recommend that the PS-4 and associated hardware be installed in a suitable enclosure (4 mounting holes are provided on the circuit board).

CONNECTION OF REMOTE INTERFACE CARDS

Remote interface cards may be located up to 4,000 feet from the PS-4 port selector. A single twisted pair wire is all that is required when connecting the AR-16/A relay interface to one of the RS-422 communication ports. Two twisted pairs are required when connecting the ADC-4/A, ADC-8/A, ADC-16/A, STA-8/A or STA-16/A interface cards to one of the RS-422 communication ports. Shielding of the cable is not required but is recommended to prevent possible damage to the computer hardware during electrical storms. If you have experienced equipment damage as a result of voltage transients, we recommend that you take one or more of the following steps (in order of highest priority).

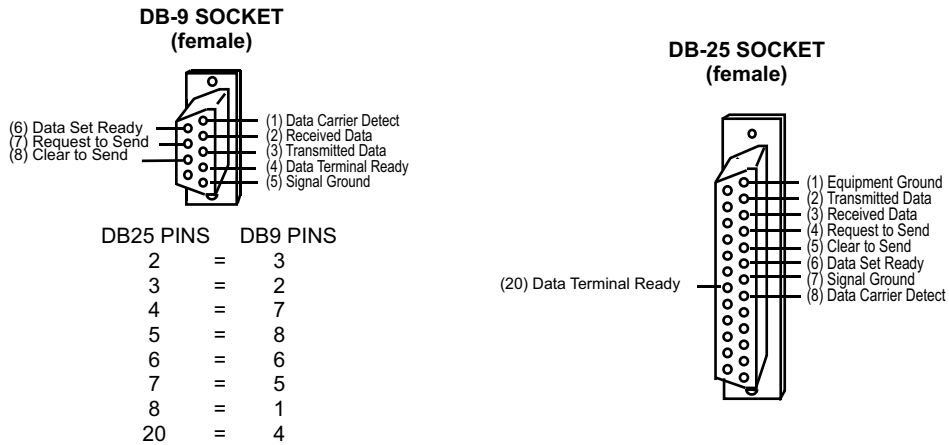
VOLTAGE TRANSIENT AND ELECTRICAL STORM PROTECTION

The RS-422 line receivers & line drivers (the 3486 & 3487 chips) are sensitive to induced electrical transients on the twisted pair communications lines between the PS-4 and the interface card (transients may occur during major electrical storm activity in the immediate area). If the PS-4 is to be connected to the communication lines during electrical storm activity or if the PS-4 is used in a 24 hour industrial application where high reliability is required, use of one or more of the following protection methods is strongly recommended.

(1) Install the PS-4 port selector and the associated interface cards in a metal enclosure. Use shielded twisted pair wire for use between the PS-4 and the interface card. Connect the shield at both ends to the metal enclosure and connect the metal enclosure to a good earth ground (an electrical outlet ground will usually be sufficient). Install a good quality voltage surge/spike protector in the electrical outlet that supplies power to your computer, PS-4 and associated equipment. Plug the electrical cord for the computer, PS-4 and associated equipment into the protected outlet on the voltage surge/spike protector. Install another voltage surge/spike protector in the electric outlet which supplies power to the remote interface cards at the remote location in the same manner.

(2) Install TransZorbs across the RS-422/RS-485 lines on each of the PS-4 communication ports (a total of 6 TransZorbs for each RS-422 port) and across the power input of the PS-4 (a total of 3 TransZorbs). Repeat the TranZorb installation for the RS-422 lines and power input of each remote interface card. The part number for the RS-422 TransZorb kit is (SP-422K) and the part number for the 12 volt DC power input TransZorb kit is (SP-12K). Installation instructions are provided with the kits.

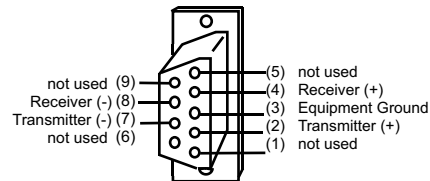
RS-232 CABLE PIN CONNECTIONS



SHOWN ABOVE ARE COMMON CONNECTORS USED FOR CONNECTION TO MOST RS-232 PORTS (the connectors are viewed from the rear/solder side)

NOTE: When connecting the computer to the PS-4 I/O port, the pins on the PS-4 plug (DB-9) to the computer DB-9 socket will be pin to pin identical (pin 2 to pin 2, pin 3 to pin 3 etc.). Do not reverse the transmit/receive or control lines. For connection of a computer DB-25 connector to the PS-4 I/O, connect the DB-9 pins 3, 2, 7, 5 & 4 to the computer DB-25 pins 2, 3, 4, 7 & 20 (in corresponding order). Connector cables for connecting the PS-4 to your computer are available. The part numbers are shown below. All of the PS-4 port selector RS-422 port connections are as follows:

RS-422 PORT CONNECTIONS FOR THE PS-4 AND CO-422



DB-9 PLUG (viewed from solder side)

SERIAL CABLE PART NUMBERS

DB25 to DB9..... part # CC-DB25-P4
 DB9 to DB9..... part # CC-DB9-P4

SET-UP AND TESTING

Upon receiving the PS-4 communications port selector, you should connect and test the operation of the hardware to verify proper operation. Please set-up and test as shown below.

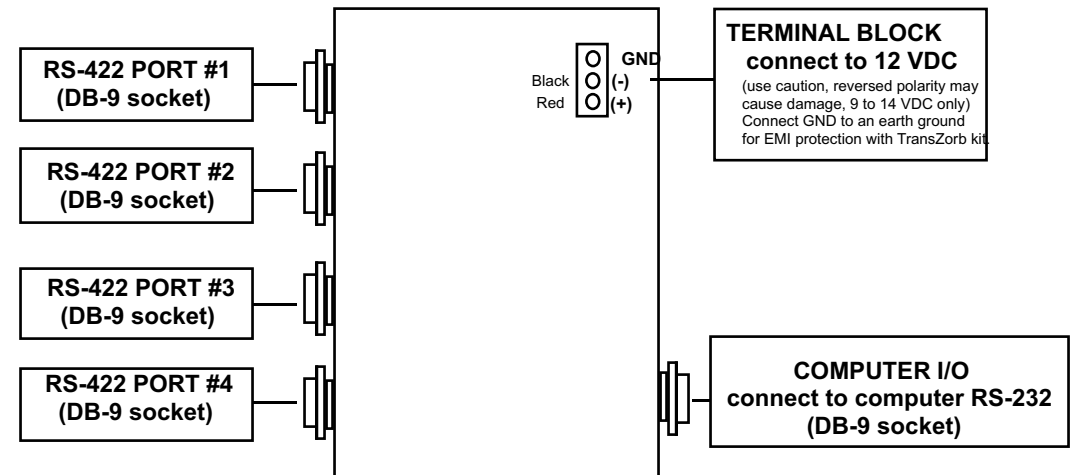
(1) Connect the PS-4 Port Selector to COM 1 on your computer using the appropriate cable.

(2) Connect the PS-GP-1 DC power supply to the molex connector on the PS-4 (the connector is provided with the PS-4 in a separate packet). USE CAUTION....REVERSED POLARITY MAY CAUSE DAMAGE. A 9 volt DC power source is recommended to reduce the heat dissipation of the on board regulator. The voltage applied to the power input must not exceed 14 volts DC or the Maxim driver chip will be damaged. Measure the voltage of your power source before applying power to the PS-4 (many unregulated power supplies will produce substantially higher voltages than the stated voltage stamped on the case of the power supply).

(3) Connect (1) ADC-16/A interface card to each RS-422 port on the PS-4 port selector. The interface card should be set to 9,600 baud (after testing set to 19,200 baud for maximum speed if desired).

(4) Use the test program (provided on CD) for testing of the PS-4. Verify proper operation of each ADC-16 and the PS-4 port selector. The test program will create the appearance that all 4 ports are connected simultaneously by rapidly scanning all 4 ports or manual mode can be selected to test one port at a time.

PS-4 CONNECTION DIAGRAM



PS-4 COMMUNICATIONS SOFTWARE

The desired RS-422 communications port on the PS-4 is selected by setting the RTS and DTR control lines on your RS-232 communications port to the correct state. To select one of the four ports, set RTS and DTR as shown below (be sure to use the correct RS-232 control register for the RS-232 port which is connected to the PS-4).

| RTS | DTR | PORT SELECTED | DECIMAL VALUE TO REGISTER |
|-----|-----|---------------|---------------------------|
| 0 | 0 | 1 | 0 |
| 0 | 1 | 2 | 1 |
| 1 | 0 | 3 | 2 |
| 1 | 1 | 4 | 3 |

NOTE: 0=low and 1=high

The RTS & DTR control lines are set by writing the proper value to the RS-232 modem control register. The modem control registers for RS-232 ports COM1 through COM 4 (IBM & compatibles) are as shown. Examples for selecting the desired PS-4 communications port are shown in GW Basic, Quick Basic and Turbo C.

| SELECTED PORT | BASIC COMMAND | C COMMAND | PC I/O COM PORT | REGISTER* |
|---------------|---------------|--------------------|-----------------|-----------|
| 1 | OUT &H3FC,0 | outportb(0x3FC,0); | COM 1 | 3FC (hex) |
| 2 | OUT &H3FC,1 | outportb(0x3FC,1); | COM 2 | 2FC |
| 3 | OUT &H3FC,2 | outportb(0x3FC,2); | COM 3 | 3EC |
| 4 | OUT &H3FC,3 | outportb(0x3FC,3); | COM 4 | 2EC |

*The basic and C examples shown above are for use when the PS-4 I/O is connected to COM 1. To use the PS-4 on other COM ports, substitute the register for the desired COM port. NOTE: The COM port on the PC is the physical hardware interface which your serial cable plugs into. The average PC can usually provide for up to four or more COM ports. When four COM ports are installed, your PC will have four RS-232 connectors on the back of your computer. The PS-4 may be used with any RS-232 port (provided that the port is true RS-232 with the RTS & DTR control lines).

EXAMPLE: OUT &H2EC,2 will connect the #3 port on the PS-4 to the PC COM 4. Additional examples are on the test disk. Use the DOS type command to list the programs on your screen. To use non-standard COM ports, you must determine the I/O port & registers for the non-standard COM port.

NOTE: When using GW Basic, bit 3 in the modem control register must remain on or communications will terminate (when using the OPEN COM command to set the communications protocol). Add 8 to the decimal value which is sent to the modem control register to set bit 3 (8 thru 11). Another characteristic of the Basic OPEN COM command is that both DTR and RTS will be set when the OPEN COM command is executed and the PS-4 will select port #4. To select another port, place the out command after the OPEN COM command and execute immediately after using the OPEN COM command. EXAMPLE:

```
10 OPEN "COM2:9600,N,8,2,CS,DS,CD" AS #1
20 OUT &H2FC,8
```

The above basic example opens COM 2 and selects port #1 on the PS-4 port selector.