Serial Ports

General Information

Types of Serial Port Connections

There are three main varieties of serial ports for Silicon Graphics systems. They are the 9 pin “D” (EIA-232), the 9 pin “D” (EIA-422) and the 8 pin Mini-DIN (EIA-232/EIA-422). The number and type of ports found on various platforms are found in the table below.

Chassis Type	Model	9 Pin (DB-9) EIA-232	9 Pin (DB-9) EIA-422	8 Pin Mini-DIN	8 Pin DIN Powered Peripheral Port	4 Pin Mini-DIN Power Port
Twin Tower 12 Slot	4D/60, 70, 80, 120, 210, 220, 310, 320, 420	4			2[1]	
Twin Tower 15 Slot	4D/120, 210, 220	4			2[1]	
	4D/240, 340, 440	8				
Predator Rack	4D/240, 280, 340, 380, 440, 480	8 or 16[3]			2	
Single Tower 13 Slots	4D/85, 210, 220, 240, 310, 320, 340, 420, 440, Crimson	4			2	
	4D/240, 340, 440	8				
Terminator Rack/ Eveready Deskside	Onyx/8, 16, 24 Challenge XL, Power Challenge L, Power Challenge XL	3	1		2	
Personal IRIS	4D/20, 25	2				2[2]
	4D/30, 35	2		2		2[2]
Indigo	All			2		
Indigo2	All			2		
Indy	All			2		

Table 1 Serial Port Types on SGI Platforms

1. Available only as an option taking up one I/O Panel space
2. Available as an option only for the TFLU type chassis.
3. Minimum 8 serial ports available for 4 CPU systems (240, 340, 440), 16 ports available for 8 CPU systems (280, 380, 480).

Some systems also included a connection known as a “powered peripheral port”. This ports purpose is to provide power to external devices such as Spaceball and the StereoView emitter. The 8 pin DIN connection also provides a sync signal used by the StereoView emitter for switching between eyes. The 4 pin Mini-DIN connection only provides power for external connections, no actual serial port signals are available.

SGI also offers options to expand the number of available serial ports. These take the form of add-in VME cards with either 6 or 32 ports per added board. For those systems in the Twin Tower and Single Tower chassis with more than one CPU board, four serial ports are added with each CPU, up to a maximum of 16.

Serial Port Access and Naming

Serial ports are access by using the device file /dev/tty*xnn*, where x is the type of connection desired, and nn is the number of the serial port. SGI systems provide three types of serial port connections.

A ttyd*nn* (where *nn* is the port number) device is used for simple serial connections that do not require hardware flow control. An example would be teriminals or tablet type devices.

A ttym*nn* device is used for devices that require modem control signals.

A ttyf*nn* device is used for devices that understand hardware flow control signals.

The serial man page contains more detailed information about serial port usage.

Serial Port Voltage Levels

The table below defines the input and output voltage levels for the various serial port implementations.

Protocol	Platform	I/O Voltages	
		Mark	Space
EIA-232	R2300, IP4, IP5, IP6	-12 V	+12 V
EIA-423	Indigo, 4D/30, 4D/35	-5 V	+5 V
	Indigo^2. Indy	-9 V	+9 V
EIA-422	Onyx, Challenge	0 V	+5 V

Table 2 Serial Port I/O Voltage Levels

Note: On the Indigo specifically, it is possible that the control signals could drop below the acceptable “legal” limits.

Maximum Data Transfer Rates

The maximum data transfer rate for all EIA-232 and EIA-423 serial ports is 38,400 Baud. For the EIA-422 ports the maximum data transfer rate is 38,400 Baud.

9 Pin (DB-9), EIA-232 Serial Port

Connector Drawing

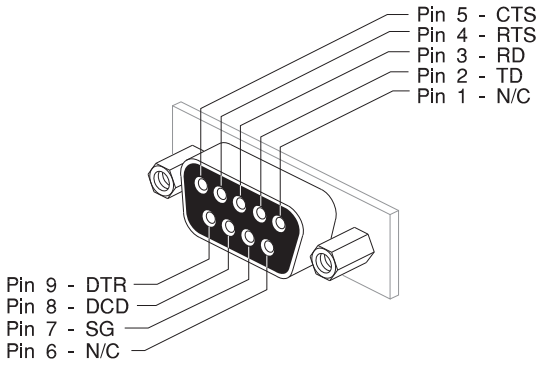

Figure 1 DB-9, EIA-232 Serial Port Connector

Pinout

Pin	Signal Name	Description
1	N/C	No Connection
2	TD	Transmit Data
3	RD	Receive Data
4	RTS	Request To Send
5	CTS	Clear To Send
6	N/C	No Connection
7	SG	Signal Ground
8	DCD	Data Carrier Detect
9	DTR	Data Terminal Ready

Table 3 9 Pin EIA-232 Pinout

Notes:

1. While the 9 Pin serial port has the same number of pins as found on IBM PC AT the pinouts are different. Also, the PC style connector is a male connector while the SGI port uses a female connector. This means that cables and adapters for the IBM PC will not work with the SGI DB-9.

9 Pin (DB-9), EIA-422 Serial Port

Connector Drawing

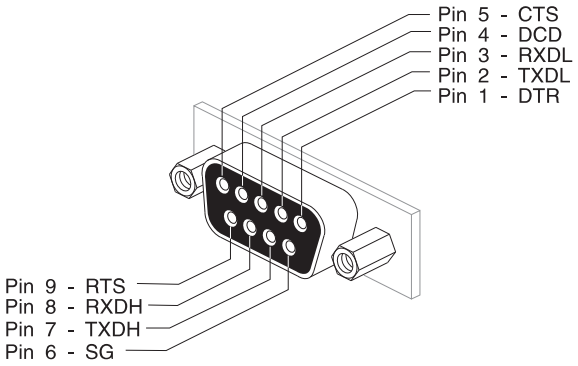

Figure 2 DB-9, EIA-422 Serial Port Connector

Pinout

Pin	Signal Name	Description
1	DTR	Data Terminal Ready
2	TXDL	Transmit Data Low
3	RXDL	Receive Data Low
4	DCD	Data Carrier Detect
5	CTS	Clear To Send
6	SG	Signal Ground
7	TXDH	Transmit Data High
8	RXDH	Receive Data High
9	RTS	Request To Send

Table 4 9 Pin EIA-422 Serial Port Pinout

8 Pin Mini-DIN Serial Port

Connector Drawing

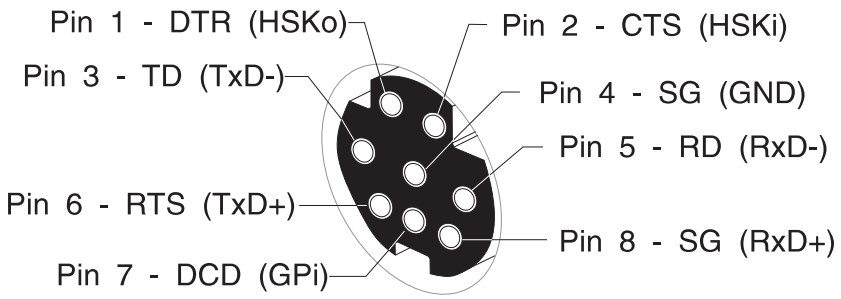

Figure 3 8 Pin Mini-DIN Serial Port Connector

Pinout

(EIA-423 Mode)

Pin	Signal Name	Description
1	DTR	Data Terminal Ready
2	CTS	Clear To Send
3	TD	Transmit Data
4	SG	Signal Ground

Pin	Signal Name	Description
5	RD	Receive Data
6	RTS	Request To Send
7	DCD	Data Carrier Detect
8	SG	Signal Ground

Table 5 8 Pin Mini-DIN EIA-232 Serial Port Pinout

(EIA-422 Mode)

Pin	Signal Name	Description
1	HSKo	Output Handshake
2	HSKi	Input Handshake Or External Clock
3	TxD-	Transmit Data -
4	GND	Signal Ground

Pin	Signal Name	Description
5	RxD-	Receive Data -
6	TxD+	Transmit Data +
7	GPi	General Purpose Input
8	RxD+	Receive Data +

Table 6 8 Pin Mini-DIN EIA-422 Serial Port Pinout

Notes:

1. Switching between EIA-423 and EIA-422 modes is accomplished by using a streams ioctl. Consult the serial man page for more information.

8 Pin DIN Powered Peripheral Port

This port was not originally built into the Twin Tower chassis. Two ports were added on a separate I/O panel as an option. Starting with the Single Tower (Diehard) chassis, the high-end systems were designed to incorporate two of these ports.

Connector Drawing

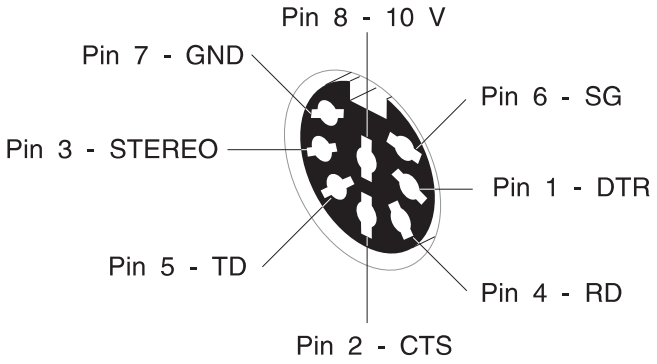

Figure 4 8 Pin DIN Powered Peripheral Port Connector

Pinout

Pin	Signal Name	Description
1	DTR	Data Terminal Ready
2	CTS	Clear To Send
3	STEREO	Stereo Field Sync
4	RD	Receive Data
5	TD	Transmit Data
6	SG	Signal Ground
7	GND	Ground Point
8	V10P	10 Volt Supply (max 500 mA)

Table 7 8 Pin DIN Powered Peripheral Port Pinout

Notes:

1. This port only operates in EIA-232 mode.
2. The ground point is provided as a chassis ground primarily for EMI considerations.
3. On those systems with this port, the available Powered Peripheral Ports share the signal lines with tty2, tty3, and tty4 (if applicable), the regular 9 Pin ports. This implies that if the 9 pin serial port is in use, the Powered Peripheral Port may not be used.

4 Pin Mini-DIN Power Ports (+5 and +12 Vdc)

While these ports are not strictly serial ports, they are typically used in conjunction with the serial ports on a Personal IRIS. There are two connections. One supplies + 5 Vdc, the other supplies +12 Vdc. Typically a "Y" cable is used to connect this port and a regular serial port to a serial device that requires power. A small I/O panel with two of these ports is available as an option on most of the Personal IRIS chassis. Early chassis did not have the opening in the chassis for this I/O panel. With the TFLU chassis the space for these connectors became standard.

Connector Drawing

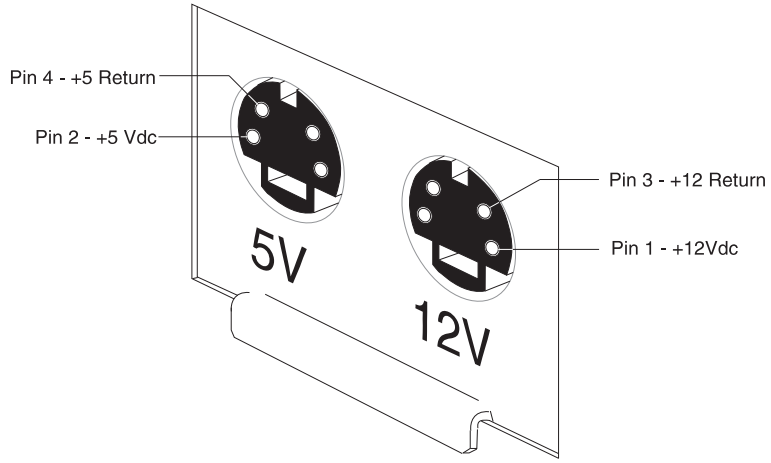

Figure 5 4 Pin Mini-DIN Power Port Connectors

Pinout

Type	Pin	Signal Name	Description
+5 Vdc Connection	1	N/C	No Connection
	2	+5	+ 5 Volts dc (1A max)
	3	N/C	No Connection
	4	5VRTN	+ 5 Volt Return
+12 Vdc Connection	1	+12	+12 Volts dc (0.5A max)
	2	N/C	No Connection
	3	12RTN	+ 12 Volt Return
	4	N/C	No Connection

Table 8 4 Pin Mini-DIN Power Port Pinout