

Connect the Serial Port

The HYBRID-D11 provides a serial port which can be used to communicate with CAD (Computer Aided Design) systems, a remote host computer, a paper tape reader/punch, or other storage device. As shipped, this port is set for RS-232C operation.

The specifications for the RS-232C interface are as follows:

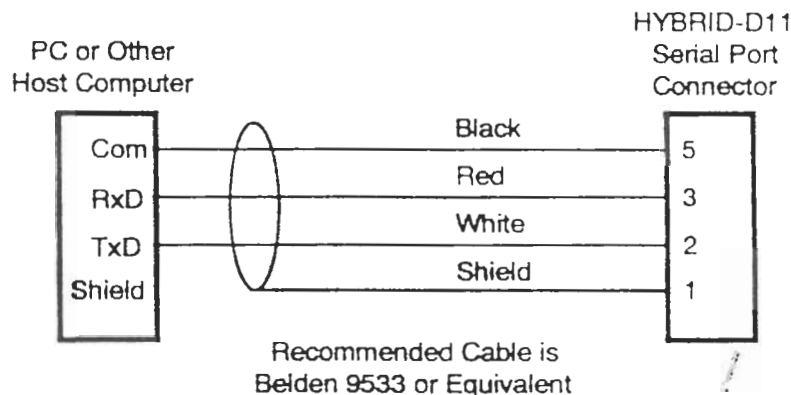
- EIA RS-232C standard interface
- Uses Shield, TxD, RxD, and Common (pins 1, 2, 3, and 5)
- ASCII or RS-422 character set
- 7 data bits, 1 parity bit, 1 or 2 stop bits
- Parity may be Even, Odd, Mark, Space, or Ignore
- Supports baud rates of 300, 1200, 2400, 4800, 9600, or 19.2K (19,200)
- Tape read functions support XON, XOFF

Connecting RS-232C Devices

When the HYBRID-D11 serial port is configured for RS-232 operation, RS-232C compatible serial communications devices may be connected to it using readily-available RS-232C cables. The RS-232C pinout of the SERIAL connector is shown for reference in the table below.

HYBRID-D11 SERIAL Connector Pinout (RS-232C)		
<i>Pin</i>	<i>Function</i>	<i>Description</i>
1	Shield	Chassis Ground
2	RxD	Received Data from external device
3	TxD	Transmitted Data to external device
4	—	Do Not Connect
5	Common	Common Ground
6	—	Do Not Connect
7	—	Do Not Connect
8	—	Do Not Connect
9	—	Do Not Connect

If you are making an RS-232C cable, only 4 conductors are required. Construct the cable as shown below, making sure to obtain the correct mating connector for your PC or terminal. The mating connector for the HYBRID-D11 is a standard male 9-pin D-type (AMP P/N 205204-1).



Most serial communication devices (PCs, etc.) use one of two types of RS-232C connector. These are the standard DB-25 (25-pin) connector and the smaller DB-9 (9-pin) connector introduced on AT-compatible PCs. The pinouts for these two connectors are given in the table below and illustrated in the following diagrams.

Typical RS-232C Connector Pinout		
Signal	DB-25 Pin	DB-9 Pin
Com	7	5
RxD	3	2
TxD	2	3
Shield	1	N/C
RTS	4	7
CTS	5	8
DSR	6	6
DTR	8	4
DCD	20	1

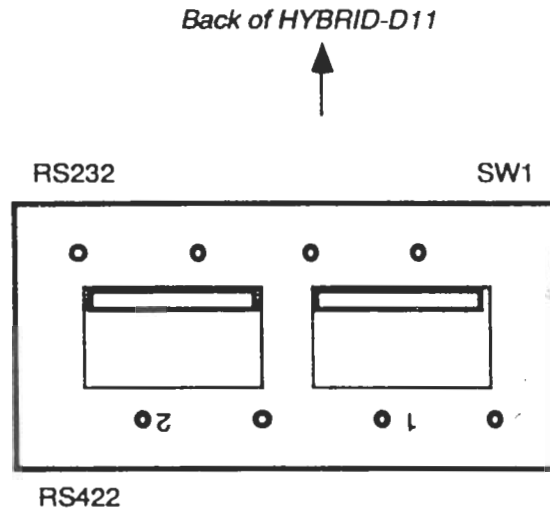
Proper grounding and shielding must be employed to insure noise immunity! All interface cables should be shielded with the shield terminated to chassis ground at one end only. The case of the HYBRID-D11 must be grounded to the machine frame and ultimately to earth ground.

Some PCs and host computers require that DTS and CTS be connected together, and that DSR, DTR, and DCD be connected together at the PC or host computer end of the cable for proper operation.

Connecting RS-422 Devices

For applications where the remote device is located further away from the HYBRID-D11 than the RS-232 specifications allow, the serial port can be set for RS-422 operation.

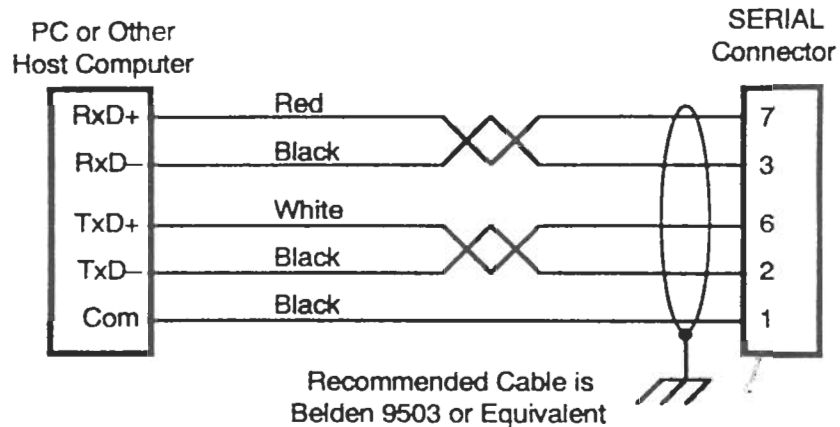
RS-422 communications is selected by removing the HYBRID-D11's cover and moving the DIP (Dual In-line Package) switch, SW1, to the RS-422 position. The switch is located near the SERIAL connector and has clearly marked positions for RS-232 and RS-422 as shown below.



When the HYBRID-D11 serial port is configured for RS-422 operation, RS-422 compatible serial communications devices may be connected to it using pre-made RS-232C/RS-422 cables. The RS-422 pinout of the SERIAL connector is shown for reference in the table below.

HYBRID-D11 SERIAL Connector Pinout (RS-422)		
Pin	Function	Description
1	Shield	Chassis Ground
2	RxD-	Received Data from external device
3	TxD-	Transmitted Data to external device
4	—	Do Not Connect
5	Common	Common Ground
6	RxD+	Received Data from external device
7	TxD+	Transmitted Data to external device
8	Aux Com	Auxiliary Power Output Common
9	Aux Pwr	Auxiliary Power Output

If you are making an RS-422 cable, 5 conductors are required. Construct the cable as shown below, making sure to obtain the correct mating connector for your PC or other host computer. The mating connector for the HYBRID-D11 is a standard male 9-pin D-type (AMP P/N 205204-1).



Be sure that the TxD+/- and RxD+/- pairs are twisted as shown above for best noise immunity.

Terminating the RS-422 Line

The HYBRID-D11 provides a jumper-selectable 220Ω termination resistor for the serial communication channel to properly terminate the RS-422 line. For best operation, the termination jumper (AMP 2-Position Shunt #531220-2) should be installed on the HYBRID-D11 to terminate the RS-422 line.

As shipped from the factory, the termination jumper is not installed. To terminate the serial ports, carefully remove the top cover of the HYBRID-D11, install the jumper on the interface board at J14, and replace the cover. A jumper at J15 connects the AUX common to the shielded chassis ground.