

Network I Lab 01

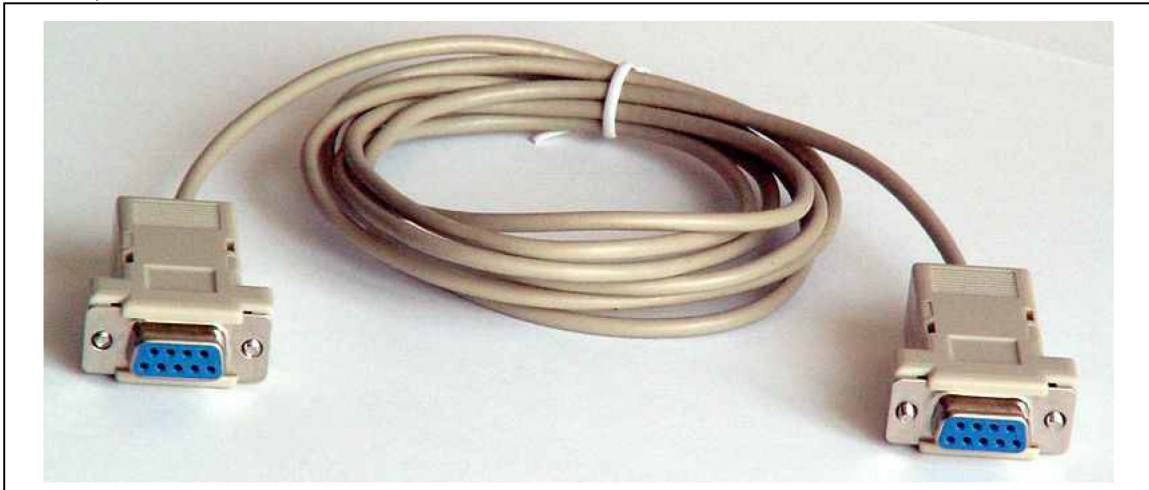
Building a Simple serial peer to peer communication network Using Null modem cables

Objective

- Build a peer2peer simple serial cable
- Use HyperTerminal software
- Use peer2peer simple serial cable

Definition

Null modem is a communication method to connect two DTEs (computer, terminal, printer etc.) directly using an RS-232 serial cable. The name stems from the historical use of the RS-232 cable to connect two teleprinter devices to modems in order to communicate with one another; null modem communication was possible by instead using RS-232 to connect the teleprinters directly to one another.

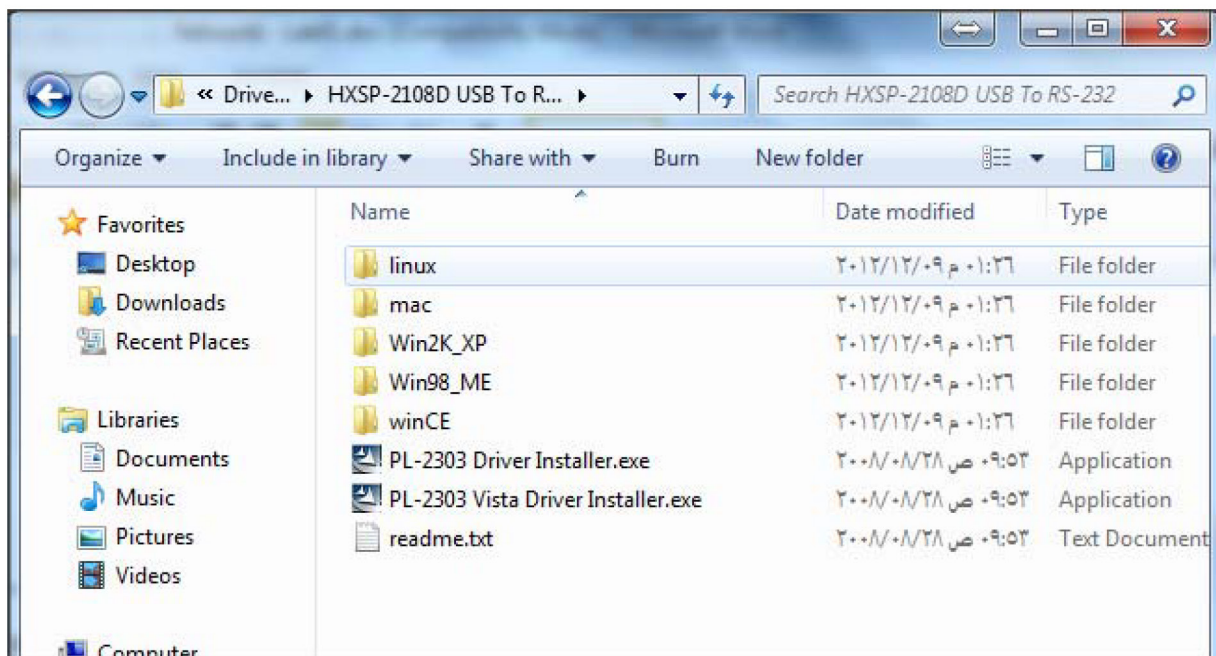


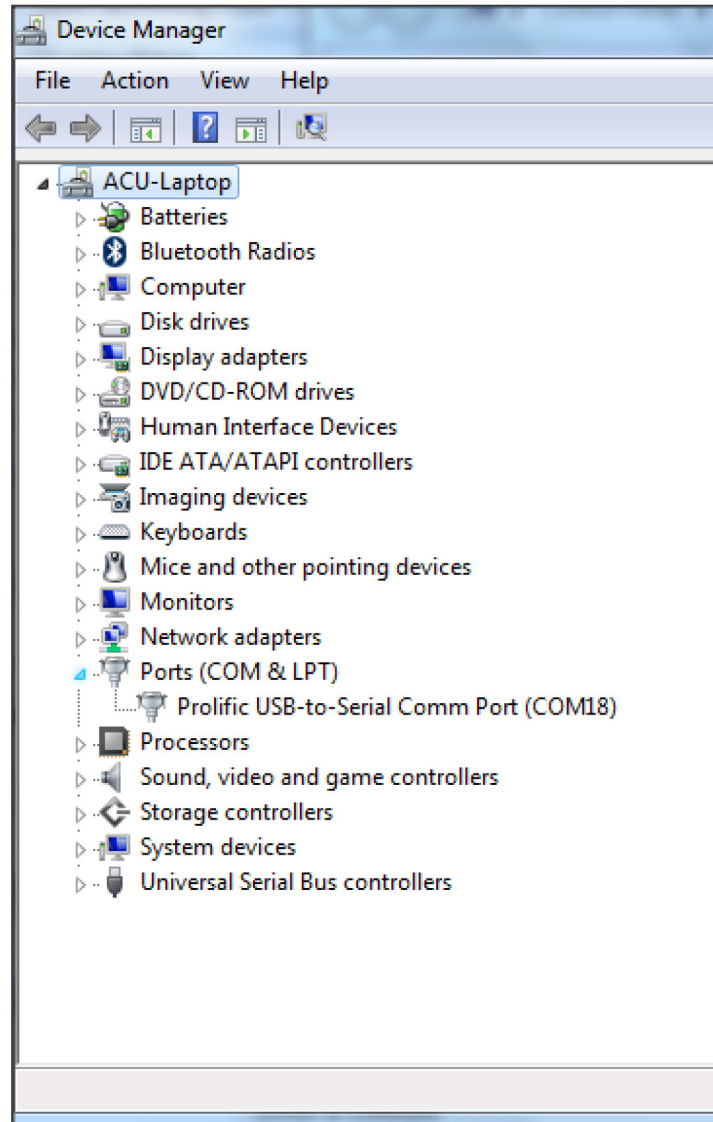
The RS-232 standard is asymmetrical as to the definitions of the two ends of the communications link so it assumes that one end is a DTE and the other is a DCE e.g. a modem. With a null modem connection the transmit and receive lines are crosslinked. Depending on the purpose, sometimes also one or more handshake lines are crosslinked. Several wiring layouts are in use because the null modem connection is not covered by a standard.

USB to Serial converter



USB to (RS232) Serial port device provides a simple and easy way to connect Universal Serial Bus(USB) and Serial port interface, With the advantage of USB port, user have the capability to utilize the peripheral with serial port interface in an easy to use environment such as plug and play & hot swap function, This adapter is designed for ideal connections to Cellular phone, Digital Camera, modems or ISDN terminal adapter with over 1Mbps data transfer rate.





Pin mapping

Signal Name and Abbreviation		DE-9 Pin	Direction
Data Carrier Detect (CD)	DCD	1	←
Received Data (RD)	RxD	2	←
Transmitted Data (TD)	TxD	3	→
Data Terminal Ready	DTR	4	→
Signal Ground	SG	5	
Data Set Ready	DSR	6	←
Request To Send	RTS	7	→
Clear To Send	CTS	8	←

Types of null modem

Connecting two DTE devices, together requires a null modem that acts as a DCE between the devices by swapping the corresponding signals

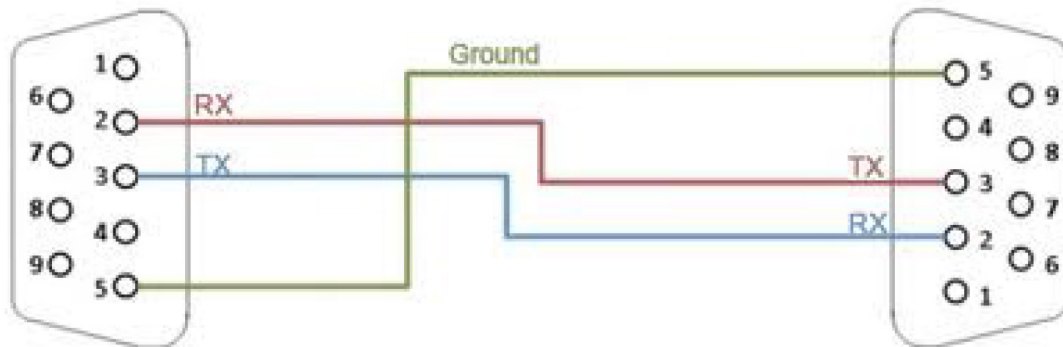
TxD ↔ RxD,

DTR (Data Terminal Ready) $\leftrightarrow$ DSR (Data Set Ready), and
RTS (Request To Send) $\leftrightarrow$ CTS (Clear To Send).

If devices require Carrier Detect (CD), it can be simulated by connecting DSR (Data Set Ready) and DCD (Data Carrier Detect) internally in the connector, thus obtaining CD from the remote DTR signal.

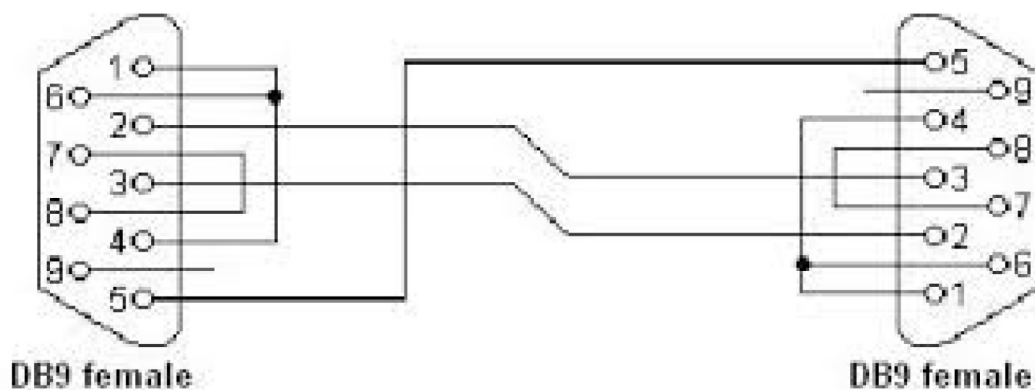
No hardware handshaking

2 (RxD)	3 (TxD)
3 (TxD)	2 (RxD)
5 (Gnd)	5 (Gnd)



Loop back handshaking

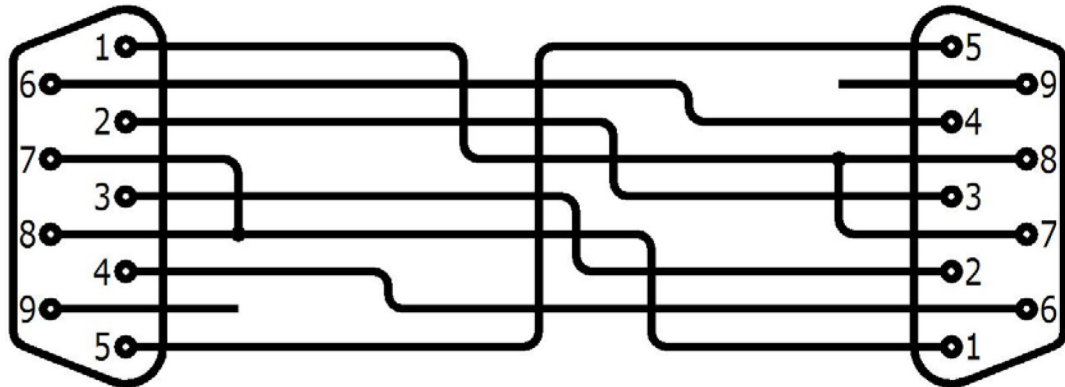
1 (Carrier Detect), 4 (Data Terminal Ready), 6 (Data Set Ready),	-
-	1 (Carrier Detect), 4 (Data Terminal Ready), 6 (Data Set Ready),
2 (RxD)	3
3 (TxD)	2
5 (Gnd)	5
7,8 (Request to Send), (Cleat to Send)	-
-	7,8 (Request to Send), (Cleat to Send)



Partial handshaking

1 (Carrier Detect)	7,8 (Request to Send), (Clear to Send)
2 (RxD)	3 (TxD)
3 (TxD)	2 (RxD)
4 (Data Terminal Ready)	6 (Data Set Ready)
5 (Gnd)	5 (Gnd)
6 (Data Set Ready)	4 (Data Terminal Ready)
7,8 (Request to Send), (Clear to Send)	1 (Carrier Detect)

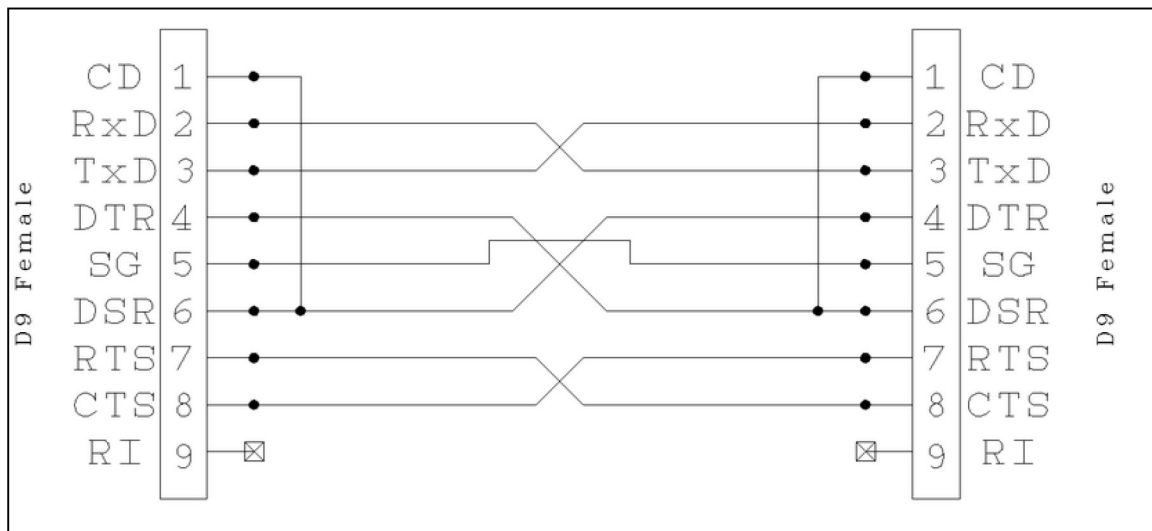
D9 Female



D9 Female

Full handshaking

1 (Carrier Detect)	7,8 (Request to Send), (Clear to Send)
2 (RxD)	3 (TxD)
3 (TxD)	2 (RxD)
4 (Data Terminal Ready)	6 (Data Set Ready)
5 (Gnd)	5 (Gnd)
6 (Data Set Ready)	4 (Data Terminal Ready)
7,8 (Request to Send), (Clear to Send)	1 (Carrier Detect)



Applications

The original application of a null modem was to connect two teleprinter terminals directly without using modems. As the RS-232 standard was adopted by other types of equipment, Null modems were commonly used for file transfer between computers, or remote operation.

Under the Microsoft Windows operating system, the direct cable connection can be used over a null modem connection.

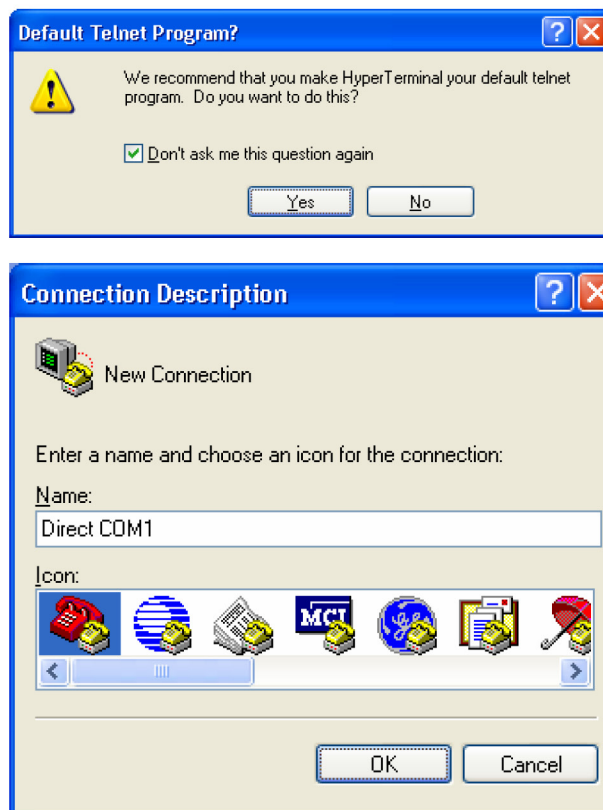
The earlier versions of MS-DOS were shipped with the InterLnk program.

Hyper ACCESS

is the name for a number of successive computer communications software, it was initially designed to let 8-bit computers communicate over a modem by Hilgraeve.

In 1995, Hilgraeve licensed a low-end version of HyperACCESS, known as HyperTerminal (essentially a "lite" version), to Microsoft for use in their set of communications utilities. It was initially bundled with Windows 95, and subsequently all versions of Windows up to and including Windows XP. Starting with Windows Vista, Microsoft no longer bundled HyperTerminal, thus Windows 7 and Windows 8 does not include it either. The commercial products HyperTerminal Private Edition and HyperACCESS support all versions of Windows up to and including Windows 8.

Hyper terminal



Connect To ? X

 Direct COM1

Enter details for the phone number that you want to dial:

Country/region: Denmark (45) v

Area code:

Phone number:

Connect using: COM1 v

OK Cancel

COM1 Properties ? X

Port Settings

Bits per second: 9600 v

Data bits: 8 v

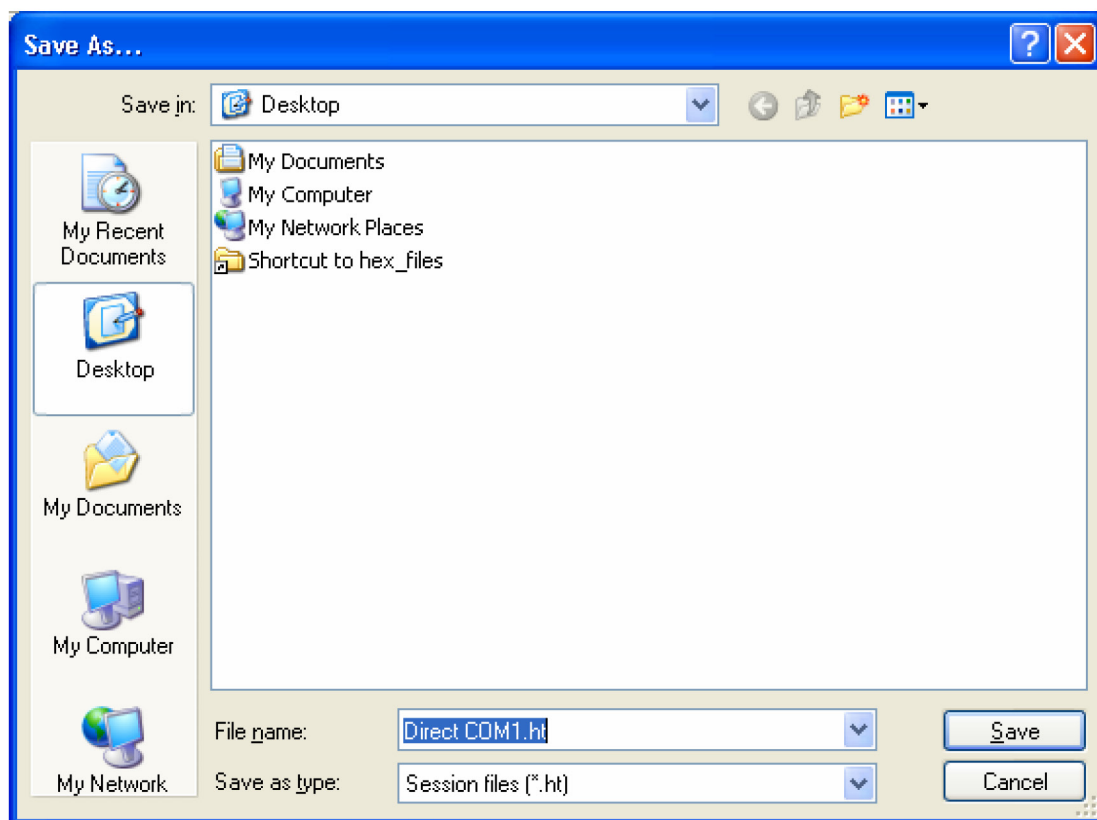
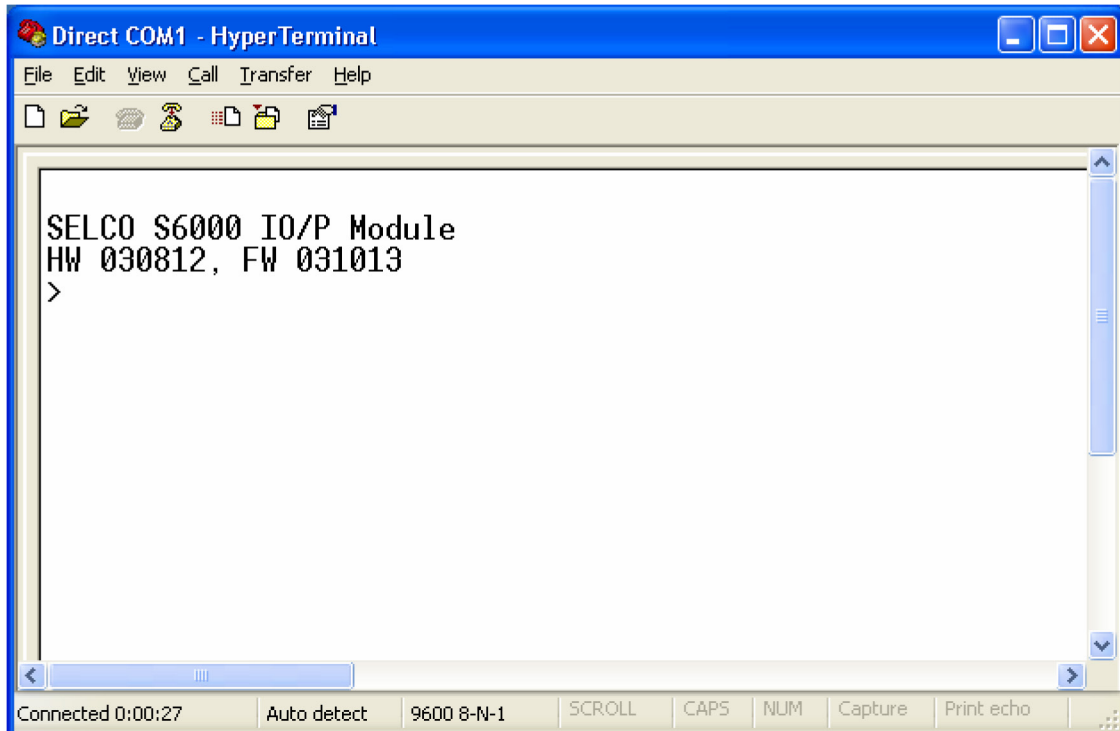
Parity: None v

Stop bits: 1 v

Flow control: None v

Restore Defaults

OK Cancel Apply

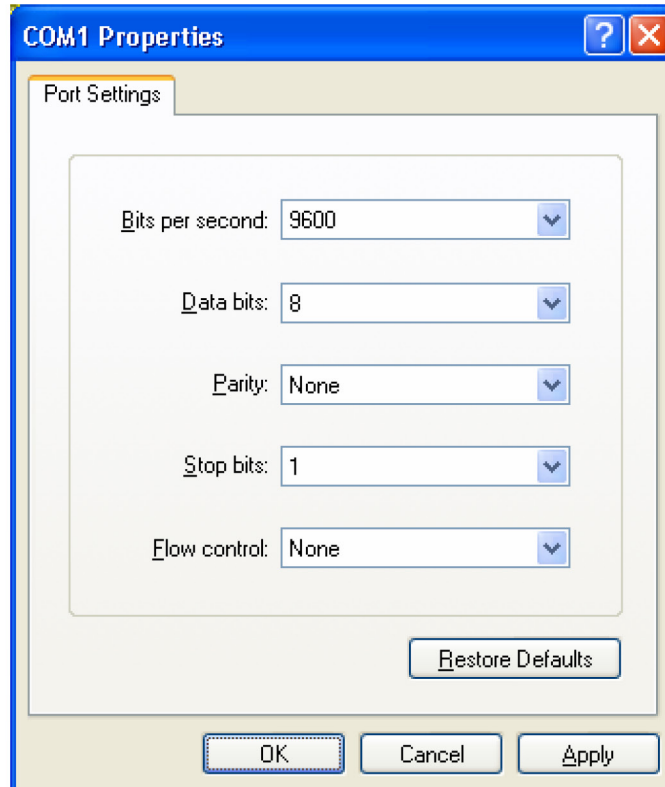


Console connection to network devices and nodes

Console port is used to connect a computer directly to a router or switch and manage the router or switch since there is no display device for a router or switch . The console port must be used to initially to install routers onto because there is no network connection initially to connect using SSH, HTTP or HTTPS. Normally router console port is a RJ45 port/ or RS232 port. The following picture shows a console port on a router.



Connect console cable to CISCO switch/router console port.
Open hyper terminal
Configure serial port as follows



Power up the cisco node
Test the following commands

- show version
- show running-config
- show startup-config
- show flash
- show log
- show ip interfaces brief
- show ip protocols
- show ip route