

Sig-Note on Configuring a Local Area Network (LAN)

The Si..Ne.. boards can be arranged in many LAN topologies. A typical Daisy-Chain topology is shown below. A flat, 4-conductor Telephone cable is used to connect a PC computer or a microcontroller (equipped with an RS232 Port) to many Si..Ne.. boards. The wire assignment for the interconnecting Telephone cable plays an important role by improving the Signal to Noise Ratio (SNR) on the cable and reducing the error rates in the network. Note that the two outside conductors (Black and Yellow) are selected for PC Transmit (Tx) and for PC Receive (Rx) lines; while the two inner conductors (Red and Green) are the ground lines. This wire selection provides a degree shielding and prevents capacitive coupling between PC Tx and the Tri-stated PC Rx lines.

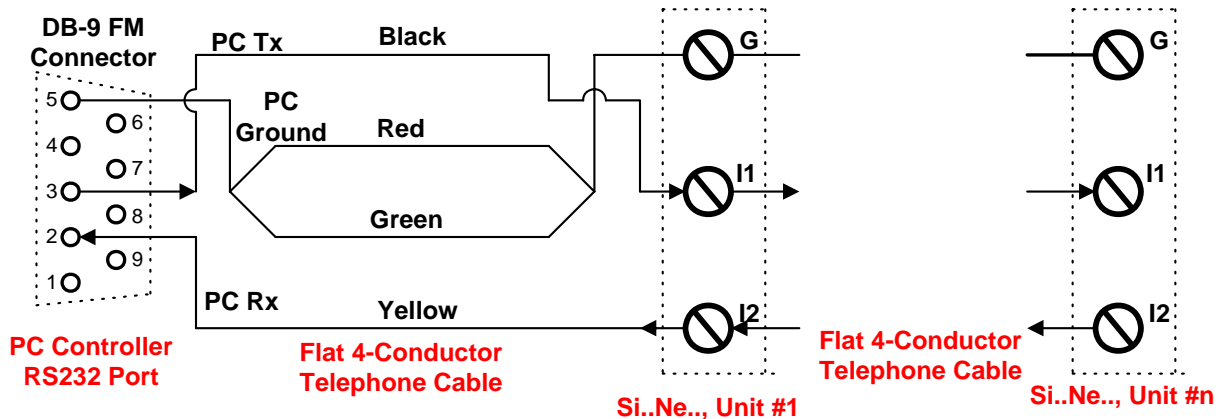


Fig 1, Electrical LAN Connection with Flat, 4-Conductot Telephone Cable

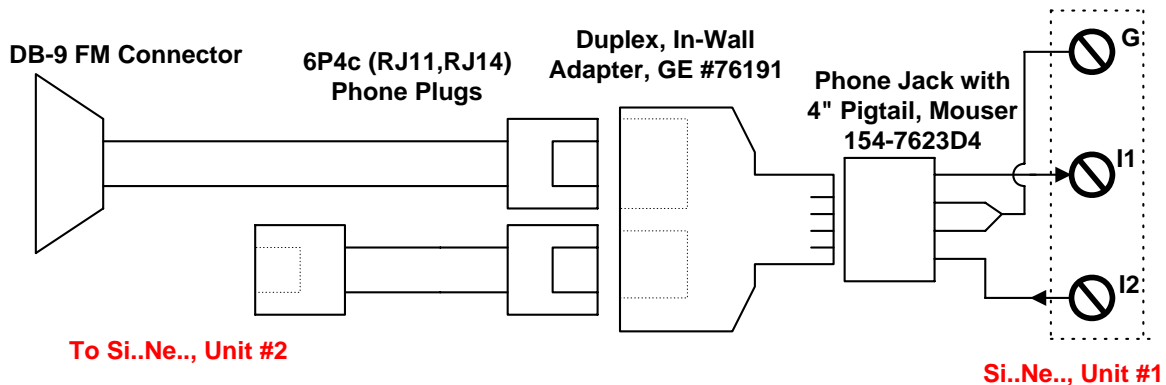
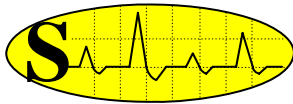


Fig 2, Physical LAN Connection with Flat, 4-Conductot Telephone Cable

The components listed below, will enable you to quickly configure a Local Area Network (LAN) with Star and/or Daisy-Chain topology. We, also, are including the Part Numbers and Order Information, which will allow you to purchase these items from local vendors.

Warning: Most Telephone Equipment Use 4-wire Cables (Cords) with "Standard Style" Plug Configurations. In these cords the plug clips are on the same side of the flat cable, but the pins are actually reversed. Do Not Use These "Standard Style" Cables. You Must Use Flat 4-wire cables with plug clips REVERSED which provide the correct pin to pin connections (as shown on the diagram, and wire-table below). Straight Cord Assemblies with various lengths and with "Reversed" Plugs can be ordered from Digikey.

The only way you can use the "Standard Style" cable assemblies, if you cut off one of the plug and crimp-on a new plug in a correct way. We recommend that you purchase a [Modular Plug Crimping Tool](#) (GE Part No: 76132) from Home Depot, for \$11.17 USD.



P1	P2	
2	BLACK	2
3	RED	3
4	GREEN	4
5	YELLOW	5

Straight Cord Assemblies

Assembly Style - Color	Length Feet (Meters)	Digi-Key Part No.	Price Each				Assmann Part No.
			1	10	50	100	
Reverse - White	7 (2.13)	A2641R-07-ND	1.64	1.39	1.19	1.01	AT-S-26-6/4W-7/R-R
	14 (4.27)	A2641R-14-ND	2.41	2.05	1.73	1.49	AT-S-26-6/4W-14/R-R
	25 (7.62)	A2641R-25-ND	3.63	3.09	2.60	2.23	AT-S-26-6/4W-25/R-R

<http://www.digikey.com/> , 6 Pos/4contacts, Straight Cords, with Reversed Plugs

To Order: [6p4c \(RJ11, RJ14\) Phone Plugs](#) (P1 and P2 on Drawing),
<http://www.digikey.com/> Part#: [A9092-ND](#) , \$0.24/10 USD

To Order: [RS232, DB-09 Connector to PC](#)
<http://www.digikey.com/> Part#: [609-1525-ND](#) , \$0.75/25 USD

To Order: [D-Subminiature Connectors Snap Plast. Strt exit E 9 way shell](#)
<http://www.mouser.com/> Part #: [649-86303637BLF](#) , \$1.06/10 USD

[Modular Phone Jack Connectors With 4" "Pigtail" Wires](#)
<http://www.mouser.com/> Part #: [154-7623D4](#) , \$1.06/10 USD

To Order: [Duplex In-Wall Adapter, White: GE Part#: 76191](#)
<http://www.homedepot.com/> Part #: [Model 26191004](#) , \$4.47/1 USD

To Order: [GE Modular Plug Crimping Tool](#)
<http://www.homedepot.com/> Part #: [Model 26132004](#) , \$11.17/1 USD



Signal Consulting, LLC

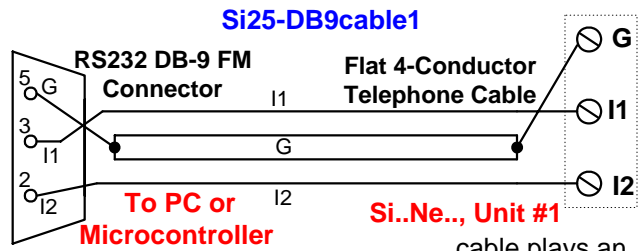
www.signallc.com

16 Wilelinor Drive, Edgewater, MD 21037-1003 USA

Phone: 410-224-8429, Fax: 410-510-1821, E-mail: info@signallc.com

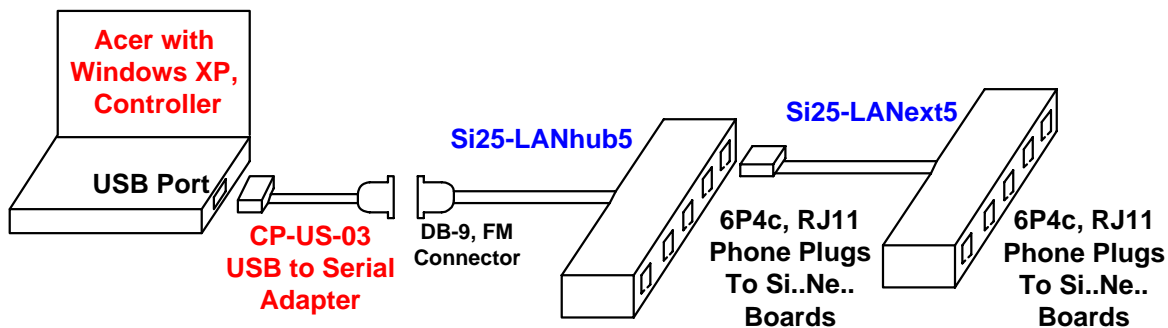
Single-Board Configuration

In a single board operation, you may use the [Si25-DB9cable1](#) cable with typical length of 10m to connect a PC or microcontroller (equipped with an RS232 Port) to an **Si..Ne..** board. A flat, 4-conductor Telephone cable is used between the PC and the **Si..Ne..** board. The wire assignment for the interconnecting Telephone cable plays an important role by improving the Signal to Noise Ratio (SNR) on the cable and reducing the error rates in the network. Note that the two outside conductors (Black and Yellow) are selected for I1 (PC-Transmit) and for I2 (PC-Receive) lines; while the two inner conductors (Red and Green) are the ground lines. This wire selection provides a degree shielding and prevents capacitive coupling between PC-Transmit and the PC-Receive lines.



Multiple-Board Configuration

In multiple board operation, you may use a Star, Daisy-Chain (or combination of both) Local Area Network (LAN) topology. A typical LAN example is shown below. In this example, the LAN controller is an inexpensive Acer Lap-Top computer using the Micro-Soft (MS) Windows XP operating system and the "Hyper Terminal" program.



To Order: [Acer Black 10.1" Aspire One AOD250-1151 Netbook with Intel Atom N270 Processor & Windows XP](#)

<http://www.walmart.com/> Model Number: **AOD250-1151**



\$268.00 USD

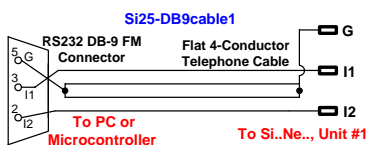
To Order: [CP Technologies, TECH USB to Serial Adapter,](#)

<http://www.pcrush.com/product/Cable-Adapters/>
Manufacturer Website Address: www.cptechusa.com
Manufacturer Part Number: **CP-US-03**



\$28.78 USD

To Order: [Si25-DB9cable1](#) with 1m white cable and DB-9 FM Connector, **\$19.00 USD**



To Order: [Si25-LANhub5](#) with 1m white cable and DB-9 FM Connector, **\$39.00 USD**



To Order: [Si25-LANext5](#) with 1m white cable and 6P4c, J11 Phone Plug, **\$29.00 USD**

