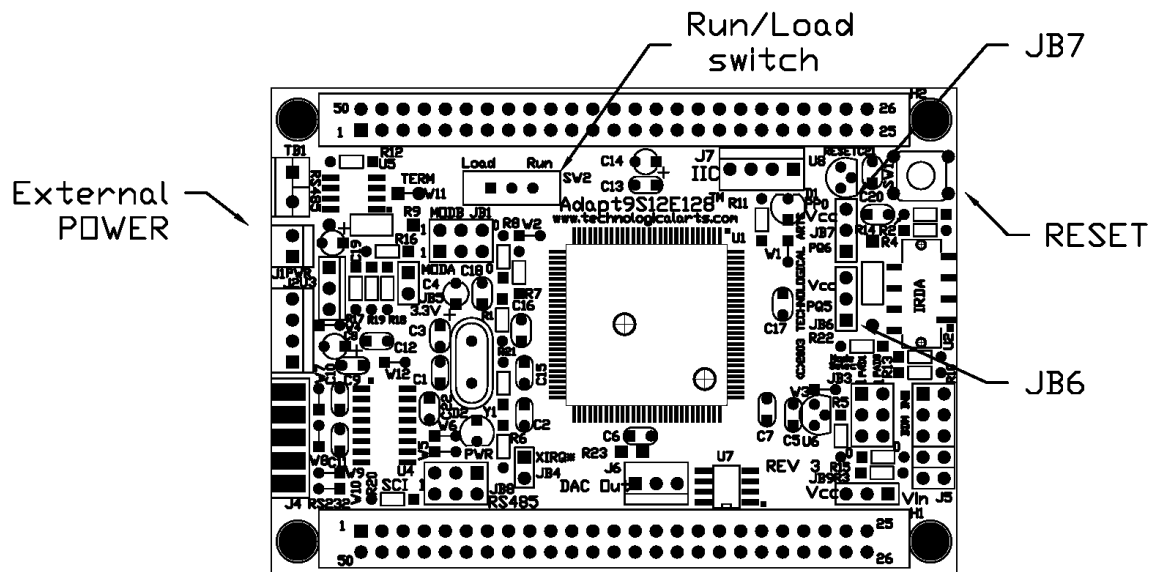


Using E128 + LAN Card with uIP

Programming Adapt9S12E128 with uBUG12:

The Adapt9S12E128 is pre-programmed with SerialMonitor/Loader to interface with uBUG12 GUI a Windows application program. Therefore, programming and erasing the MCU is made easy and straight forward.

On the Adapt9S12E128 module is the Run/Load switch to place the MCU into Run or Load mode. The switch is connected to Port A bit 6. From RESET or Power up, the SerialMonitor/Loader checks the switch status. If it is low then it will run the SerialMonitor/Loader otherwise the user's application is executed.



To start, slide Run/Load switch to Load, power up the board then press the RESET pushbutton momentarily. Double click on the uBUG12 icon to execute uBUG12 program. In the command bar type "con 1" (without the double quote) for COM 1 and "con 2" for COM 2. A "connect" message will appear in the uBUG12 window to indicate that PC and Adapt9S12E128 established communications.

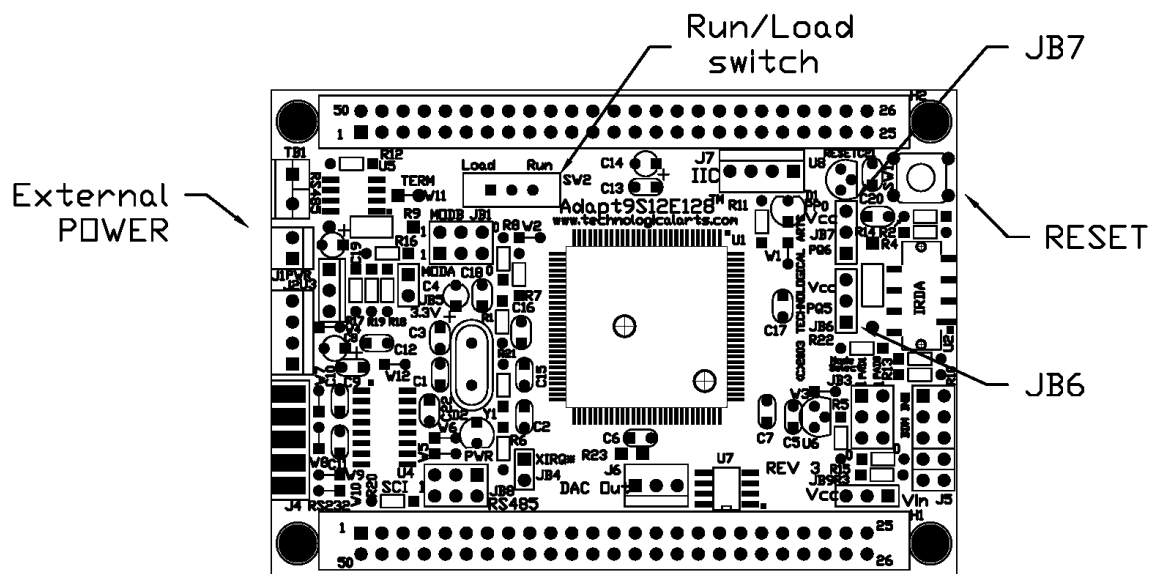
Make sure to erase the FLASH memory by typing the command "FBULK". Then to program, type the command "FLOAD ;b" for banked S records. For non-banked S2 the command is "FLOAD". Once the command FLOAD is invoked uBUG12 will open an explorer window to help search and locate the S record. Double click on the appropriate S record to initiate download to MCU.

After successful a programming a message "LOADED OKAY: 1.578125Sec. Transfer rate was 9.9802kb/sec" will appear in the window. Slide the Run/Load switch to Run and press the RESET button momentarily. The programmed application is now running.

Hardware Jumper settings:

There are jumpers on both the Adapt9S12E128 and LAN card that needs to be configured.

Adapt9S12E128 – Remove the Jumper blocks on **JB6** and **JB7**. The jumper blocks JB7 with PQ6 as IrDA's sensitivity control and RESET for the LAN. Jumper blocks JB6 with PM3 control power to the IrDA as such when set the IrDA will consume certain amount current that will create thermal overload on the Adapt9S12E128 regulator. For LAN application these jumpers must be remove as not to create problems.



Make sure to connect Adapt9S12E128 H2 to LAN card P2 header. H1 and P1 may not have to be connected. It is all dependent whether the boards are stacked or in a planar arrangement.

Warning! The alignment is very important to the proper operation of the LAN card. If the LAN card is misaligned it will be damaged.

LAN Card Jumper blocks settings:

Note: Square pads are always pin 1

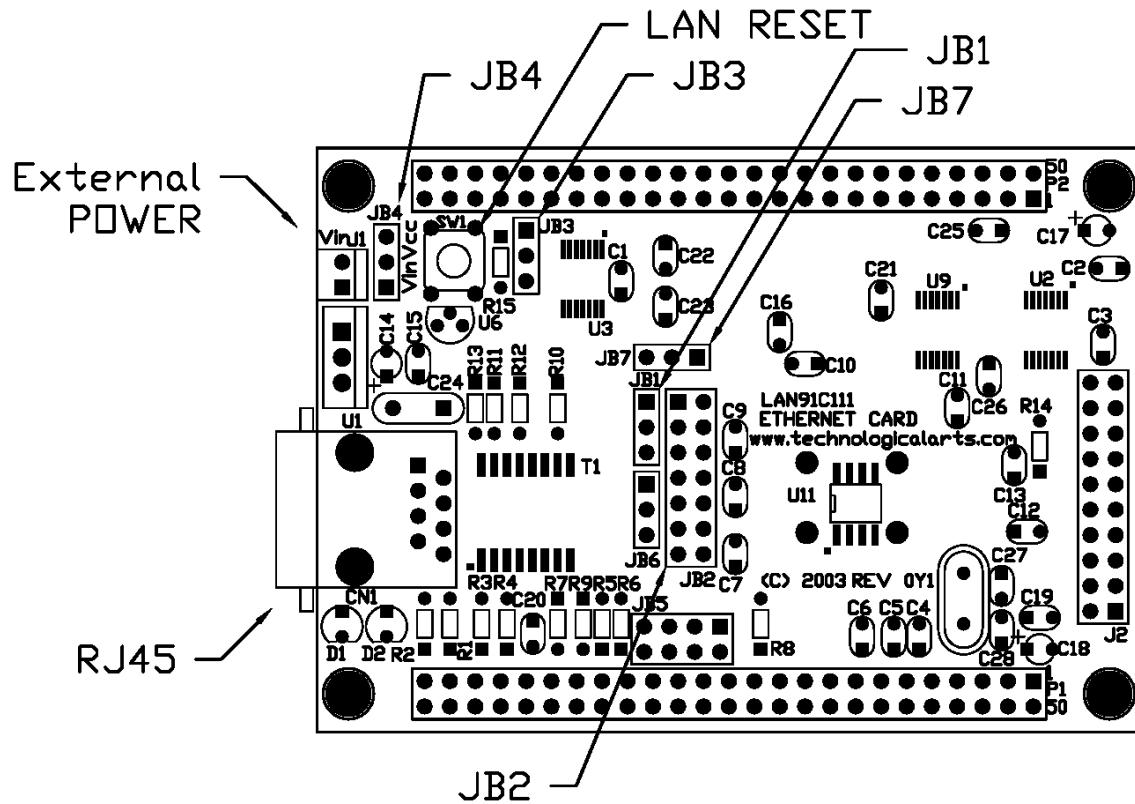
JB1 - Shunt (Short) 1,2 -> Latch decoding

JB2 - Shunt (Short) 1,2 -> LAN91C111 decoding

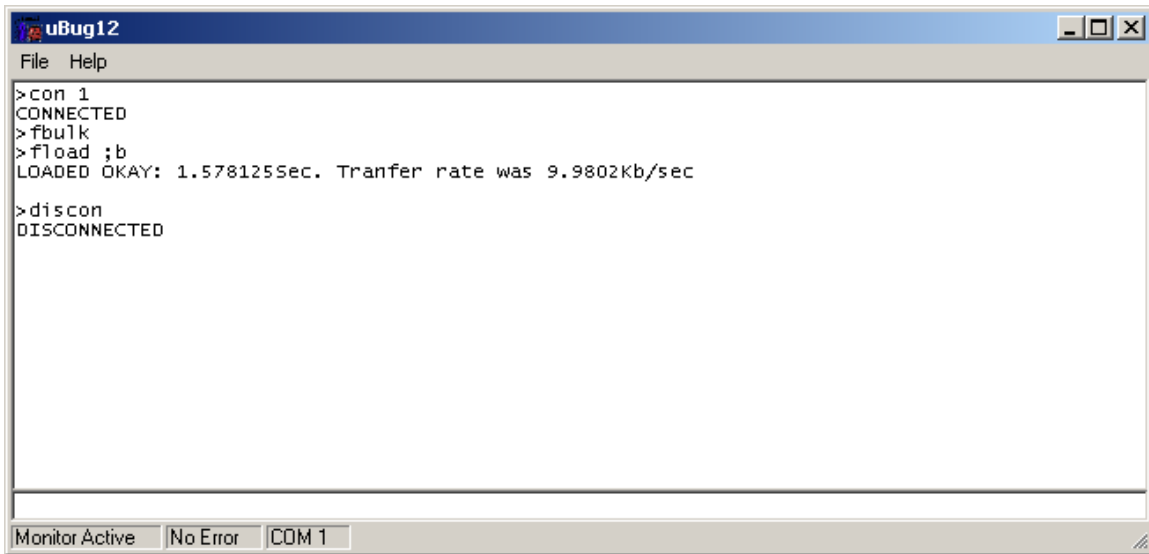
JB3 - Shunt (Short) 1,2 -> Reset Selection

JB4 - Shunt (Short) 2,3 -> Power Selection External or VCC (5V)

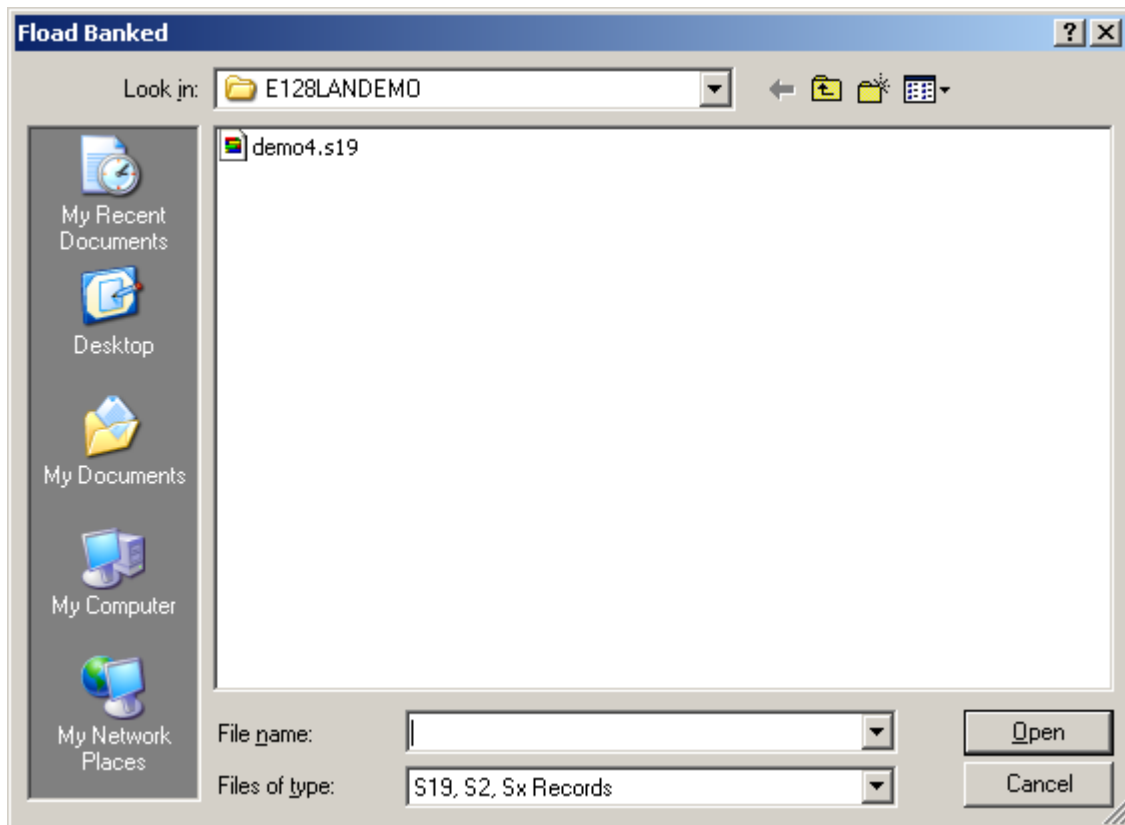
JB7 - Shunt (Short) 3,2 -> Latch decoding



Now that the Adapt9S12E128 and LAN card are setup, we now need to program the MCU with uIP *E128LanDemo.s19*. Follow the instruction above how to do so. In uBUG12 window these are the sequences as shown.

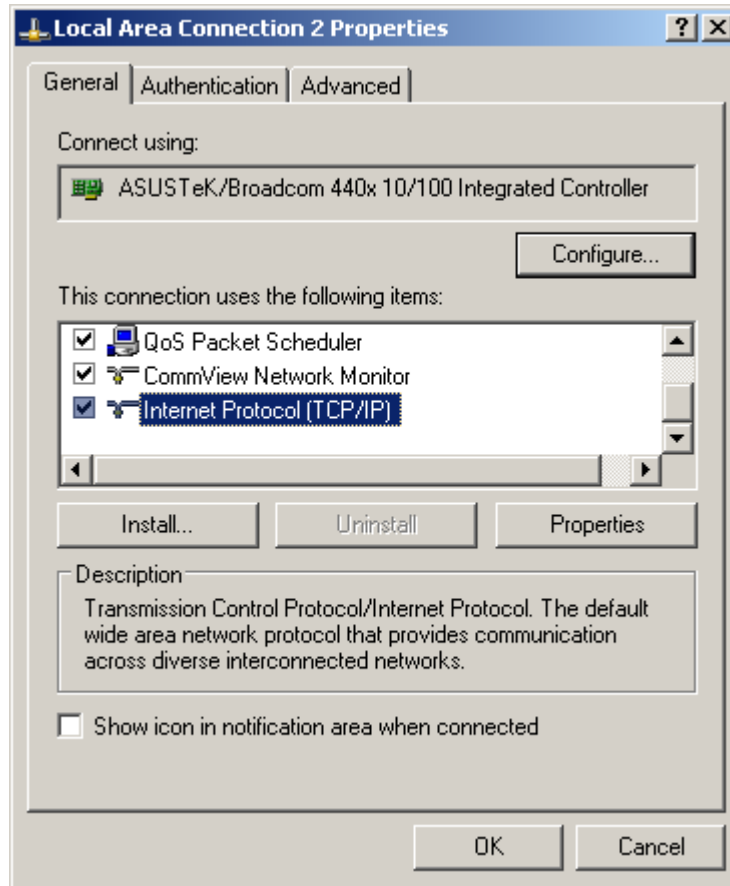


uBUG12 explorer window below is searching for the *E128LanDemo.s19* after “fload ;b” command is invoked.



Configuring PC Ethernet card:

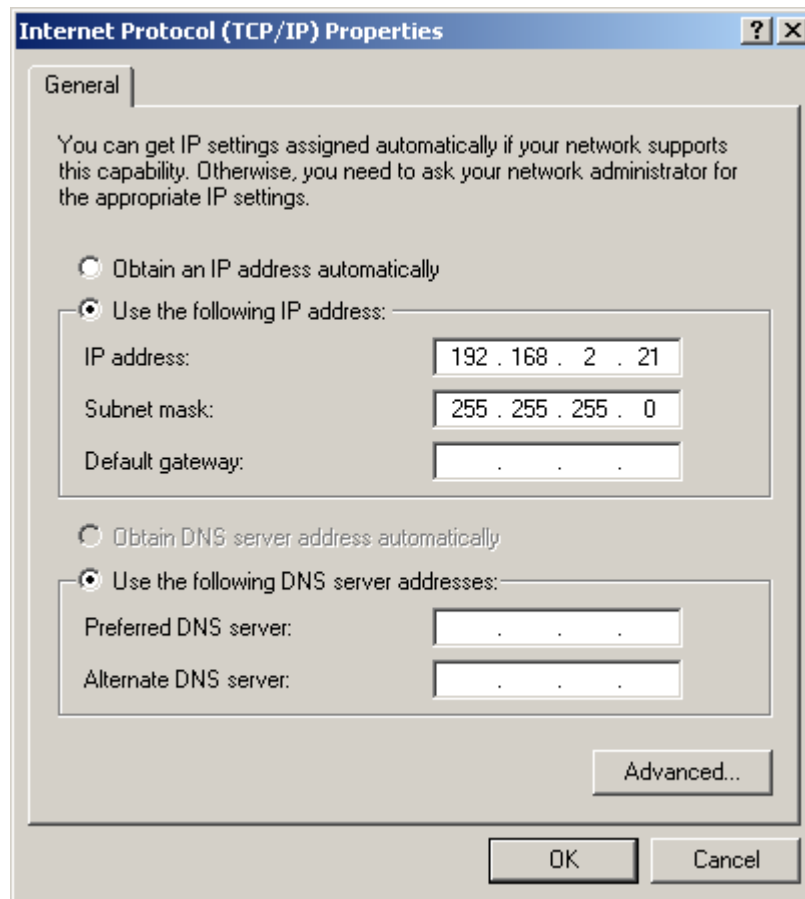
The Ethernet Card IP address must change to be able to communicate to the LAN card. Locate MyNetwork icon to change the Ethernet IP address. Below is what to look for.



Locate the Internet Protocol (TCP/IP) connection type, highlight it then press the Properties button.

The IP address of the LAN card per uIP port is 192.168.2.7. The subnet mask is 255.255.255.0

Below is what the settings should be set as an example. Once the IP address and Subnet mask are set then press the OK button then OK on Local Area Connection Properties.



Now that the PC Ethernet Card has been configured they can now be all connected. It is better to use a HUB and a straight cable to make it easy for hardware debugging. The main reason is to be able to look at the link LED activity at a glance without having to check the back of the computer. The other reason is the Packets from the PC will be sent to all ports without them being altered and be packet sniff without difficulty.

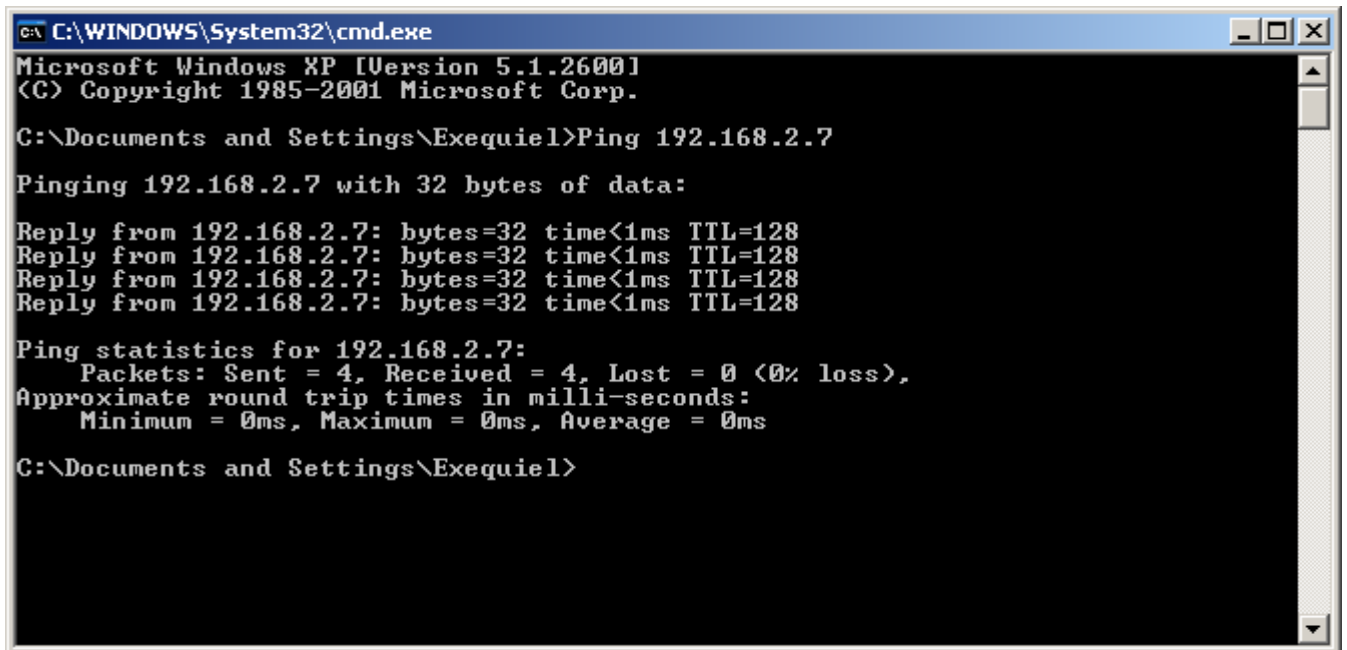
All the Ethernet cables are straight thru type. Connect the Ethernet cable from PC to HUB. Make sure the Link LED is active that correspond to the PC and HUB connections. Connect another Ethernet cable from LAN card to HUB. The Link LED on the HUB between these 2 will NOT be active but the Link LED on the LAN card will immediately become active the moment it detects the HUB.

Follow the sequences:

1. Power up Adapt9S12E128 with Run/Load switch in Run mode.
2. Hold the Adapt9S12E128 RESET button
3. Press the LAN card RESET button momentarily (make sure the E128 is still in RESET state). Upon release the LAN card Link LED is again ON.

4. Release Adapt9S12E128 RESET button. The HUB Link LED should now be active. If it is active then there is a connection between PC Ethernet - HUB - LAN Card.

At this point we can now PING the LAN card as shown below.



```
C:\WINDOWS\System32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Exequiel>Ping 192.168.2.7

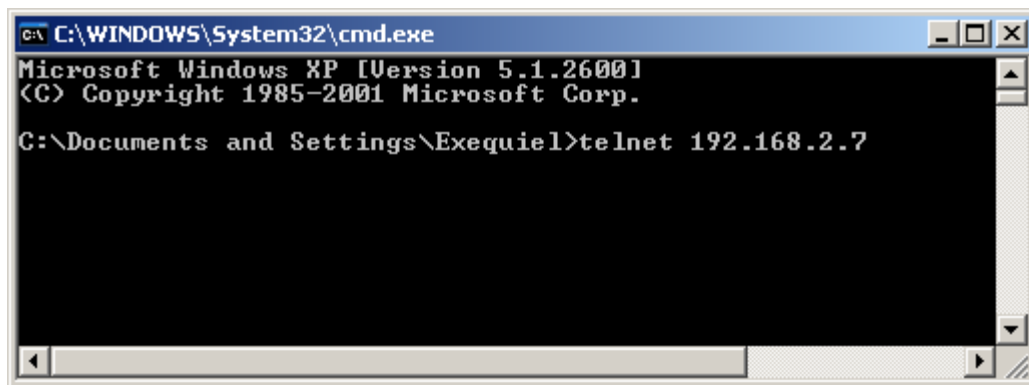
Pinging 192.168.2.7 with 32 bytes of data:

Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Exequiel>
```

We can also use a DOS Telnet session.



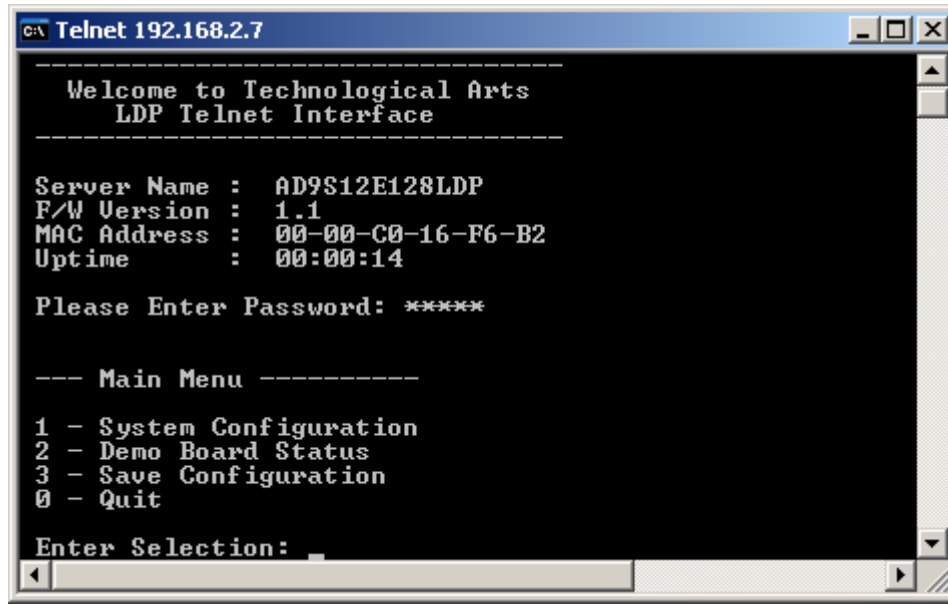
```
C:\WINDOWS\System32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Exequiel>telnet 192.168.2.7
```

Once the Telnet command is invoked the session will change as shown below. Here it is asking for the password.

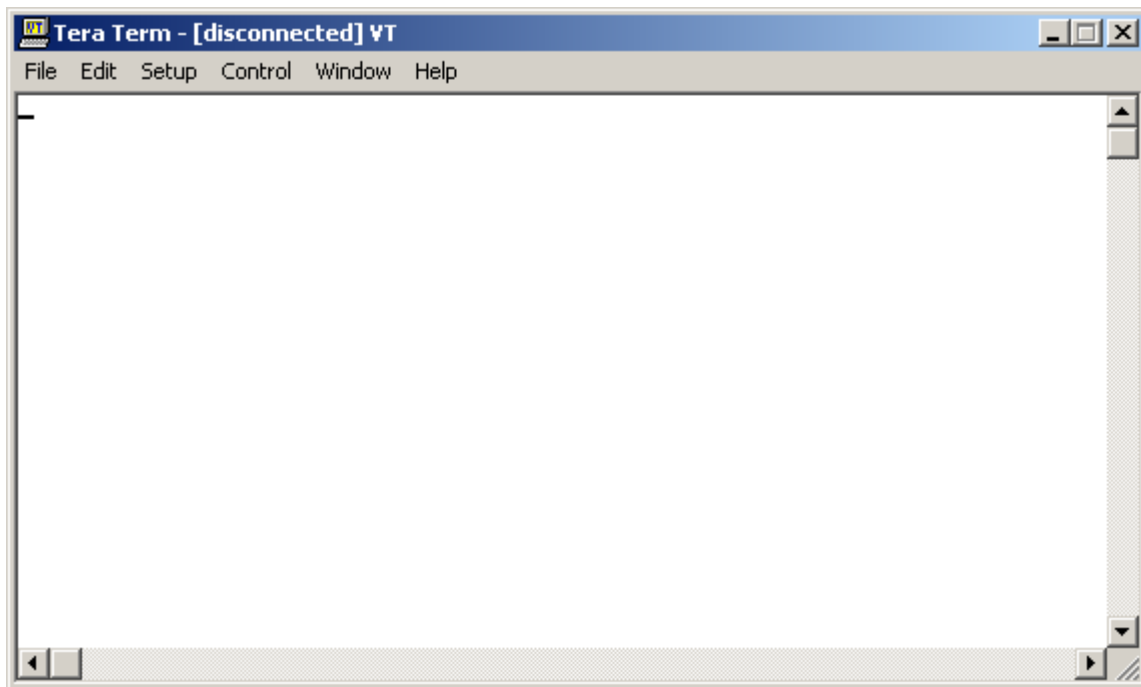
Please Enter Password: hello

Once the Password is entered then it will run the Demo application.

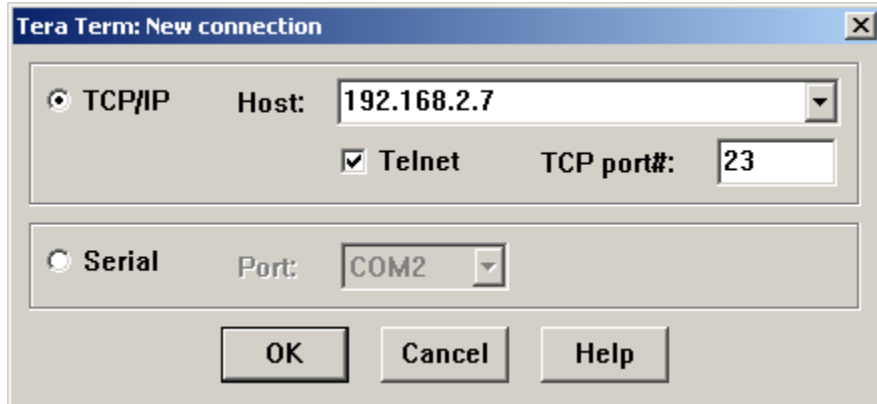


In this other example the TeraTerm GUI is used. It can be downloaded from the link <http://hp.vector.co.jp/authors/VA002416/teraterm.html>

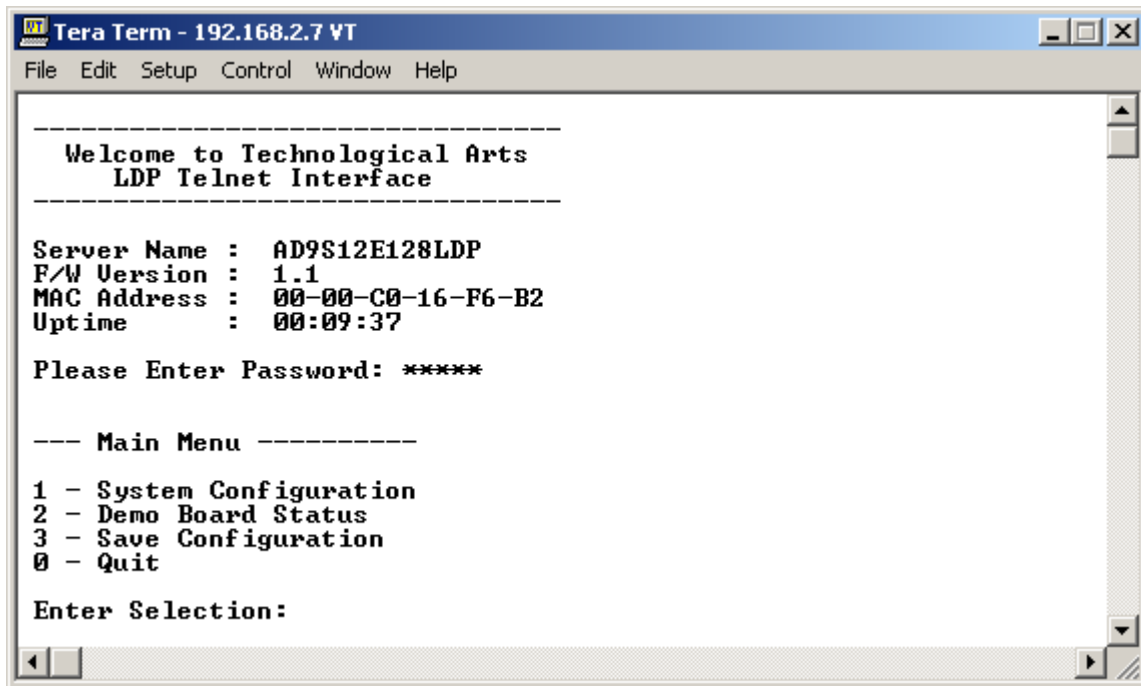
Below is a sequence how to use Tera Term with the LAN card. Open File menu and select New Connection.



Select TCP/IP, type in the Host address, Telnet type checked then press OK.



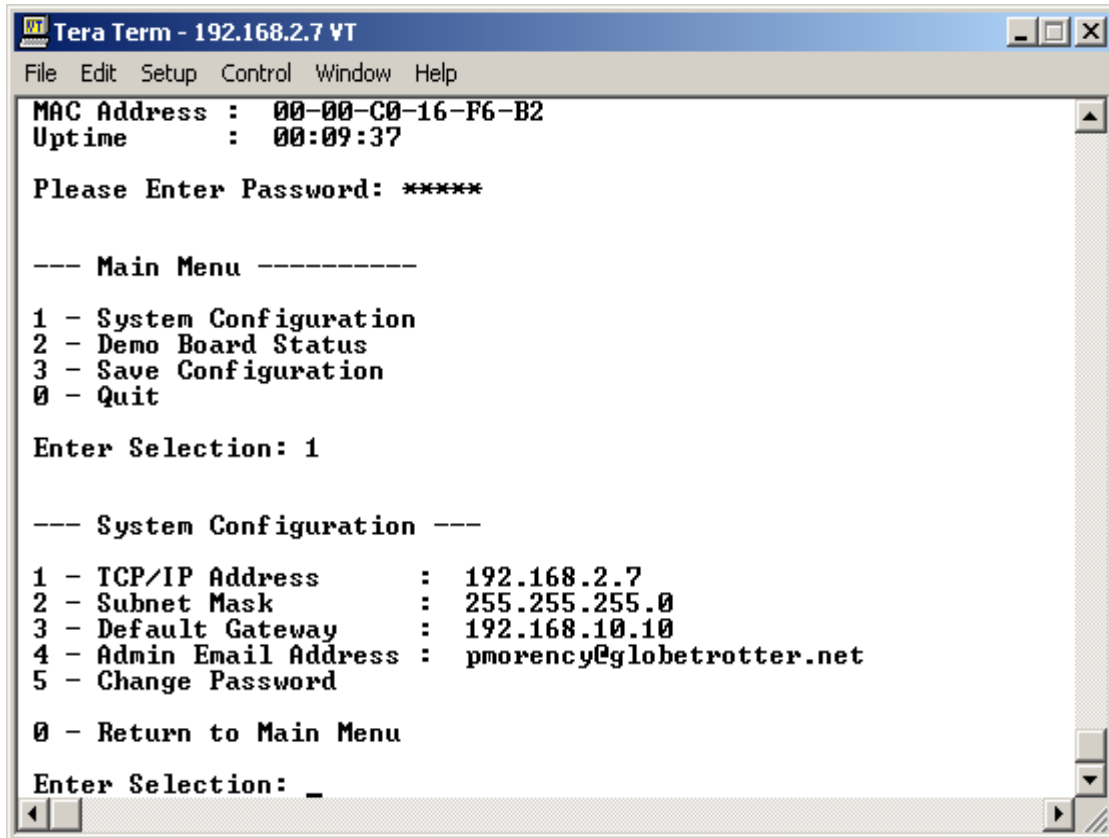
Type in the Password: hello



Choose 1 to see System Configuration

Here it will display the TCP/IP Address, Subnet Mask, Default Gateway, Admin Email Address and Change Password menu.

Do not change these settings until such time as one is familiar and confident with the hardware.



```
Tera Term - 192.168.2.7 VT
File Edit Setup Control Window Help
MAC Address : 00-00-C0-16-F6-B2
Uptime      : 00:09:37

Please Enter Password: *****

--- Main Menu -----
1 - System Configuration
2 - Demo Board Status
3 - Save Configuration
0 - Quit

Enter Selection: 1

--- System Configuration ---
1 - TCP/IP Address      : 192.168.2.7
2 - Subnet Mask         : 255.255.255.0
3 - Default Gateway     : 192.168.10.10
4 - Admin Email Address : pmorency@globetrotter.net
5 - Change Password

0 - Return to Main Menu

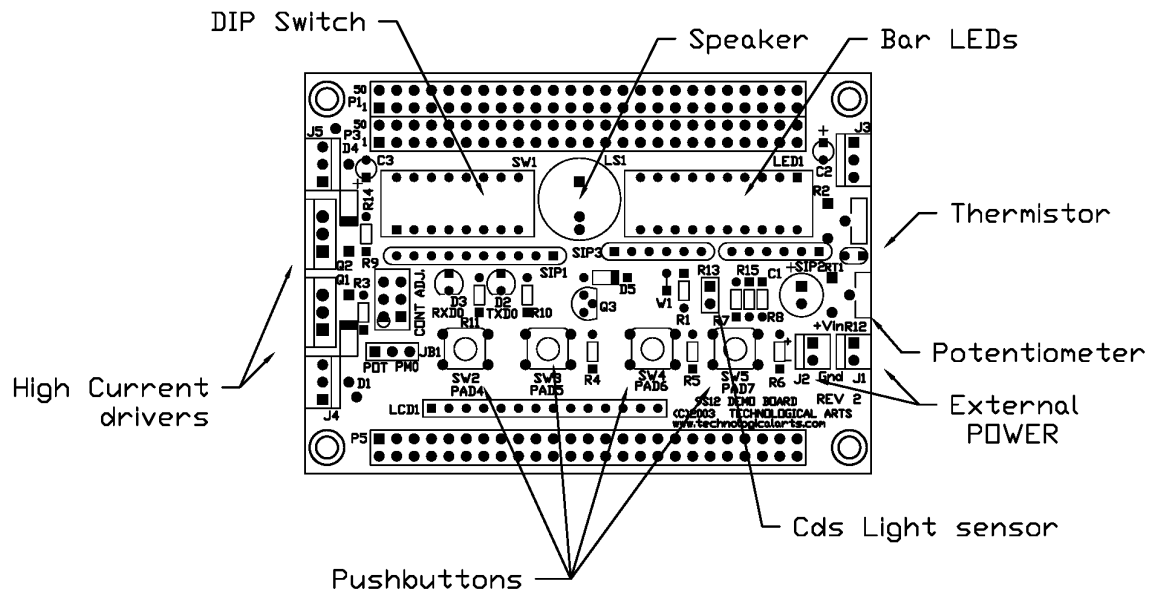
Enter Selection: _
```

Sample Application.

The demo4.s19 is an example of the TCP/ip stack implementation ported to the Adapt9S12E128 + LAN card. Here another card called Demo card is added. See link <http://www.technologicalarts.com/myfiles/AD9S12DEMO.html>

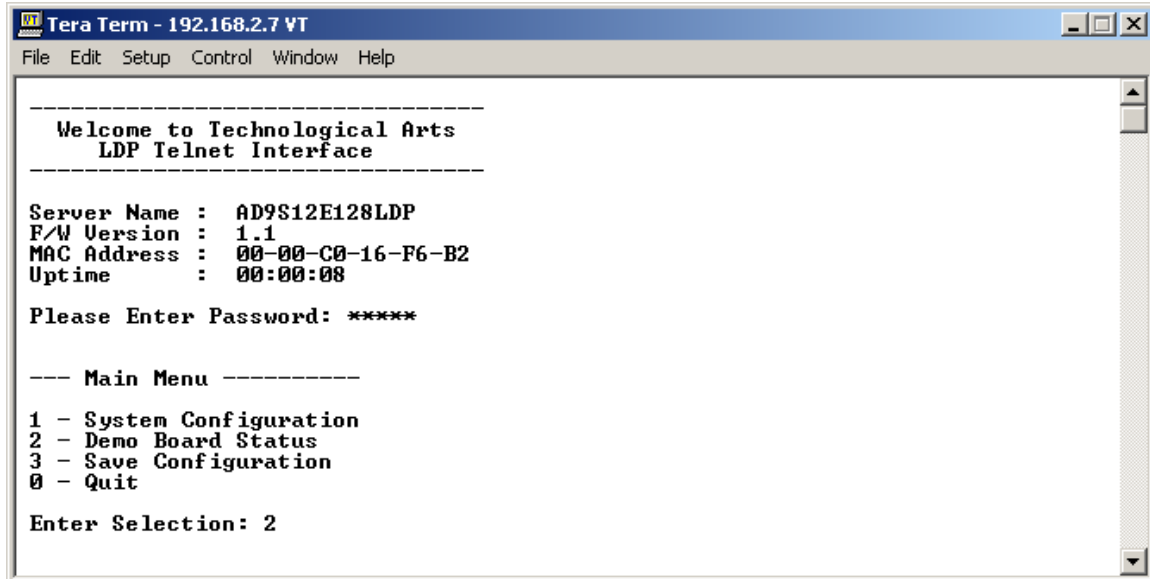
On the Demo Card are:

- 1 - Bar LED
- 4 - Pushbuttons
- 2 - High current drivers
- 1- Thermistor
- 1 - light sensor
- 1 - Potentiometer
- 1 - Dip Switch
- 1 - Speaker



The demo program will monitor the state of the DIP switch position, the analog values of potentiometer, thermistor, and Cds light sensor as percentage of full scale. As well, the high current drivers and Bar LEDs can be controlled to be turned off or on via PC keyboard.

Below is a demonstration of the demo program. Choose 2 to show demo board status.



```
Tera Term - 192.168.2.7 VT
File Edit Setup Control Window Help

-----
Welcome to Technological Arts
LDP Telnet Interface
-----

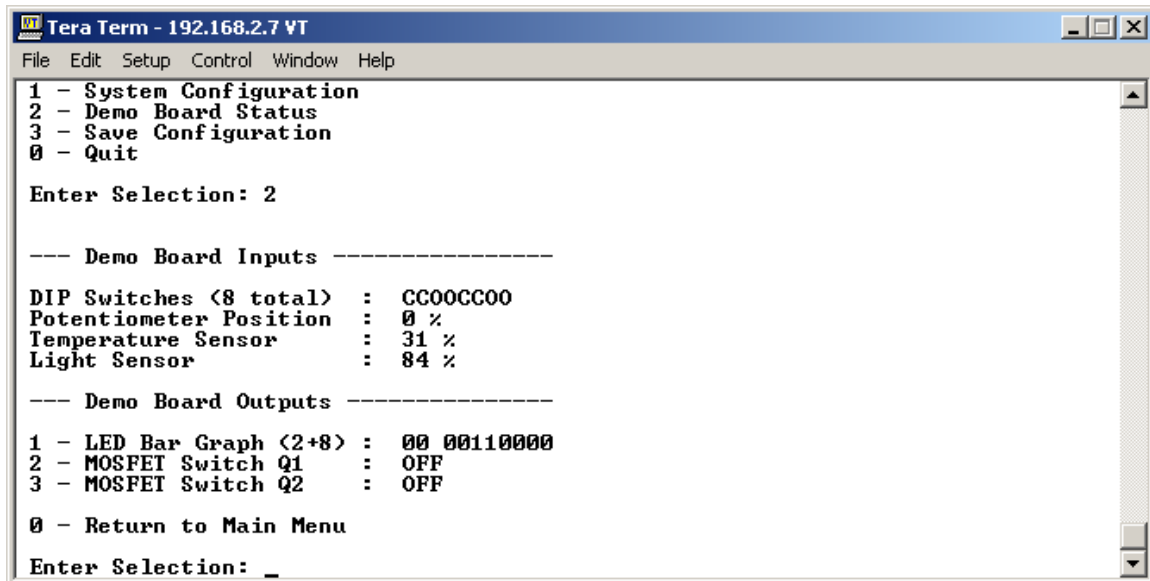
Server Name : AD9S12E128LDP
F/W Version : 1.1
MAC Address : 00-00-C0-16-F6-B2
Uptime      : 00:00:08

Please Enter Password: *****

--- Main Menu -----
1 - System Configuration
2 - Demo Board Status
3 - Save Configuration
0 - Quit

Enter Selection: 2
```

Once the command is invoked the window will change to show the inputs status of DIP Switches, Potentiometer, Temperature Sensor and light sensor. It will also show the output status of LED Bar and the high current drivers. To refresh the status, press the CR on the PC keyboard.



```
Tera Term - 192.168.2.7 VT
File Edit Setup Control Window Help

1 - System Configuration
2 - Demo Board Status
3 - Save Configuration
0 - Quit

Enter Selection: 2

--- Demo Board Inputs -----

DIP Switches <8 total> : CC00CC00
Potentiometer Position : 0 %
Temperature Sensor     : 31 %
Light Sensor           : 84 %

--- Demo Board Outputs -----

1 - LED Bar Graph <2+8> : 00 00110000
2 - MOSFET Switch Q1   : OFF
3 - MOSFET Switch Q2   : OFF

0 - Return to Main Menu

Enter Selection: _
```

This demo program can then be used as basis of one's project for Ethernet application.